

AMERICAN ARTISAN


WARM AIR HEATING • SHEET METAL
CONTRACTING • AIR CONDITIONING



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FEBRUARY
1934

AMERICAN ARTISAN



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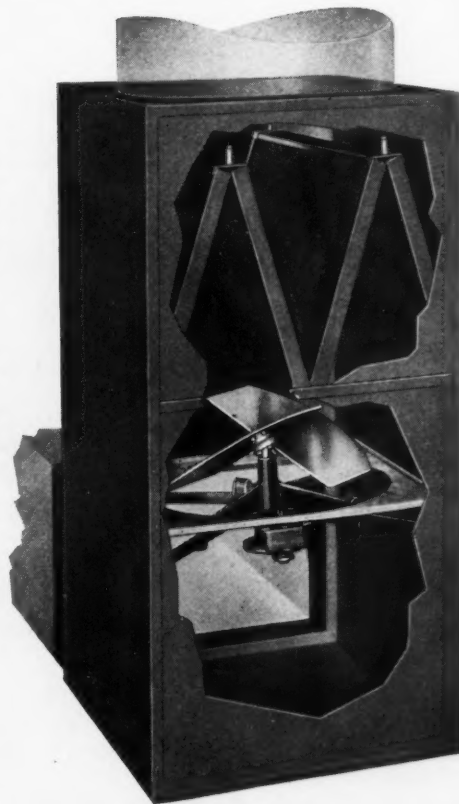
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AMERICAN ARTISAN

With which is merged

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AND

**Warm-Air
Heating**

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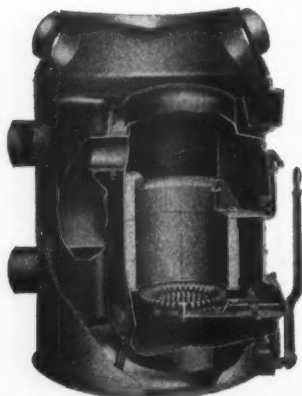
More Furnace Dealers Sell

SUNBEAM WARM AIR FURNACES AND AIR CONDITIONING UNITS

Than Any Other Kind



Sunbeam Cast Furnace. Available in 7 sizes. Made also in the pipeless type.



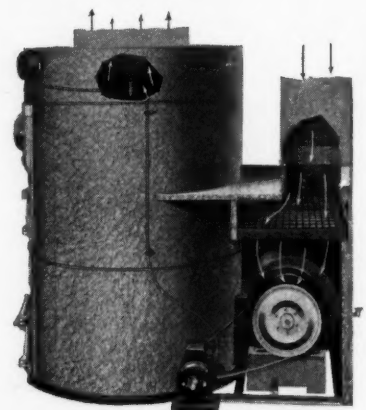
Sunbeam Steel Furnace. Available in 9 sizes. An innovation in steel furnace design.

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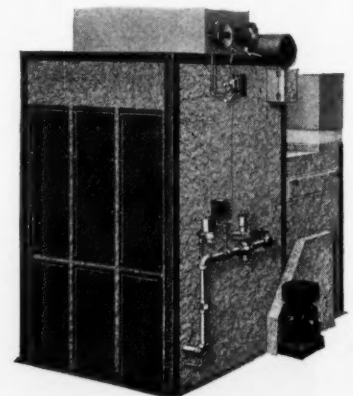
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THE AMERICAN BRASS COMPANY

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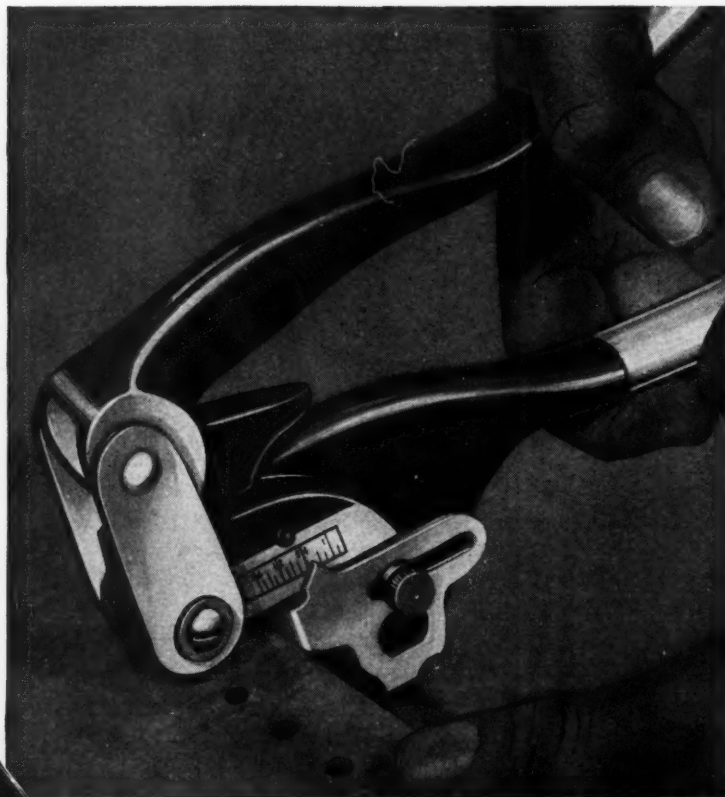


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Punches and 7 Dies (One each $\frac{3}{32}$ ", $\frac{1}{8}$ ", $\frac{5}{32}$ ", $\frac{3}{16}$ ", $\frac{1}{4}$ " and $\frac{17}{64}$ ") fitted in a handsome, sturdy steel case at \$5.90 * F.O.B. New York for the complete outfit.

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Your regular jobber will fill your order at the \$5.90 * price. Order now, or if more convenient, send us the coupon below.

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PRODUCT OF PARKER-KALON CORPORATION

Needed—A Method For Determining Costs

IN THE arguments and useless conversation which have accompanied the formation of a code for our industry to date, many of the really important provisions of the code have been buried beneath the cloak of mystery and controversy which has been thrown around the proposition.

While much of this error can be excused because of the great flurry of organization, the time has now come when contractors must take serious stock of just what this code means to them and must give plenty of time to a study of those provisions which may mean the virtual reorganization of their entire system of doing business.

These important provisions which we should now consider are not buried in the code—they are plainly presented, in language we can all understand and they mean exactly what they say.

These provisions say in brief—we shall **NOT** submit a bill or estimate without keeping an actual and correct cost record; we shall **NOT** sell or offer to sell labor, materials or services below cost; we shall **NOT** use inferior or substitute materials; we shall **NOT** induce breach of contract; we shall **NOT** countenance bribery in any form; we shall **NOT** take over defaulted contracts or doubtful settlements.

Read these provisions through again. Then turn to the full copy of the code in this issue and study Article IV word for word.

Then after studying the provisions sit down and think what these sections of the code mean to your individual business. We shall not submit bids or estimates without cost records. We shall not sell below cost.

Do you know what your cost is?

The code states you **must** know your complete costs and it means exactly that. To know these costs which you are going to be asked to produce every time one of your bids is low or a competitor doubts the legality of your bid, you will have to have a good, workable cost system.

There is no place in the code for the contractor who says—"I guess my labor cost so much." "I guess my materials cost me so and so."

Every thinking contractor will appreciate immediately that once the code is placed in effect every bid or estimate will be subject to the close scrutiny of every bidder for the job and it will be

tough going for the individual or firm which cannot produce evidence that their bid is sound, intelligent and **above** cost.

Changes are being made in the code as this is written to clarify every possible meaning of these sections covering cost. It is the intention of the men preparing the code for operation to leave absolutely no loop hole for the contractor who looks for loop holes to avoid compliance.

For instance, revisions are being made to specifically state that the contractor who works at the trade must charge his time at not less than the prevailing wage rate for his community. Other additions set forth exactly what a contractor is, what responsibility he must possess and assume and every contingency is being painstakingly worked over because the framers realize that the code will receive a minimum of compliance from far too many contractors.

Contractors who have a good bookkeeping system have nothing to fear, but sad indeed may be the plight of the man who keeps his cost records on the backs of old envelopes.

One further thought. There has been much argument pro and con these last few years over the problem of how to figure overhead, where to apply overhead, etc. Little contractors claim they have no overhead. Big contractors say their overhead staggers them. Those in between have set up arbitrary percentages running all the way from no overhead at all to several hundred per cent on productive labor.

The real meat of the argument is that every contractor, no matter how little, has overhead and under the code he must add this overhead to his estimates and be prepared to prove that his overhead figures are right.

Without much doubt we can expect to see a pre-determined percentage of overhead for all classes of shops within a given code authority zone established immediately after the zones are laid out. It behooves everyone, therefore, to give his overhead figures a thorough overhauling as quickly as possible.

There is no question but that just as soon as the code goes into effect every contractor will be compelled to know his costs and he must be prepared to defend his figures.



This is the interior of the Fish and Hunter Shop, a firm with an established operating area of more than 100 miles from home

Fish & Hunter's Operating Area Covers Parts of Three States

"THE bids are going to be opened on the new school this afternoon," remarked C. W. Low, manager of the sheet metal and roofing department of the Fish & Hunter Co., Rapid City, S. Dak. "I'll drop over," he continued casually—as though the offices of the school board were four or five blocks distant around the corner.

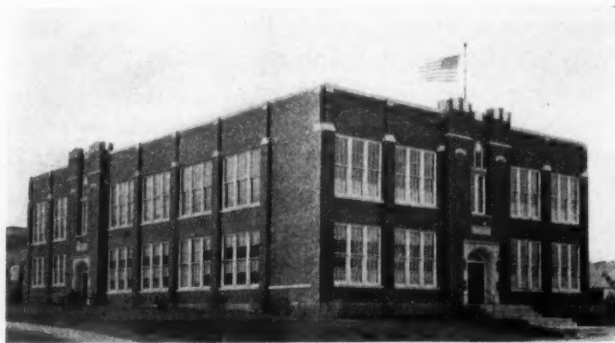
Actually, the offices were perhaps

one hundred and fifty miles distant, for this sheet metal man, located in a region of scattered settlements with all communities comparatively small, gets his volume by operating over an area as large as that of some states. Get out a map of South Dakota, and note on it such towns as Hot Springs, Deadwood, Buffalo, Pierre, Edgemont, Gordon, Nebr., Newcastle, Wyo.,

in all of which C. W. Low has handled contracts—and you will have a picture of his trade territory.

The communities range all the way from a few score of inhabitants up to a few thousand, and the total of the region is less than that of a great many cities.

A number of years ago, a state cement plant was erected near Rapid City. It was a big sheet metal job,



These two handsome buildings, the left a church and the right a school, are typical of the class of work taken by this firm operating usually at some distance of the job. Local labor is customarily used

and received national publicity. C. W. Low handled the contract for that. Public buildings—school houses, court houses, city halls, hospitals—churches, the occasional new business building, are attractive prospects.

A great deal of this company's sheet metal work is handled as a sub-contract for general contractors. It is considered important, therefore, to be present when bids are opened and contracts let. From year to year, a considerable proportion of jobs secured are signed up at such times.

The long-distance telephone is used by C. W. Low as casually as most sheet metal men use their local telephones. Operating over a large territory, the company has to deal with some additional costs. All costs are carefully accounted for by the estimate sheet reproduced in adjoining columns. It will be noted that for each item there are columns for cost of material, labor making, labor erecting, freight and dray, and total. At the foot of the form are spaces for railroad fare of men two ways, board and room for the estimated number of men and the estimated number of days, and freight on tools. Mr. Low has found this detailed estimate sheet very efficient because it makes it

The Fish and Hunter proposal sheet which is filled in and submitted to the prospect

difficult for a cost item to be overlooked.

Uses Local Labor

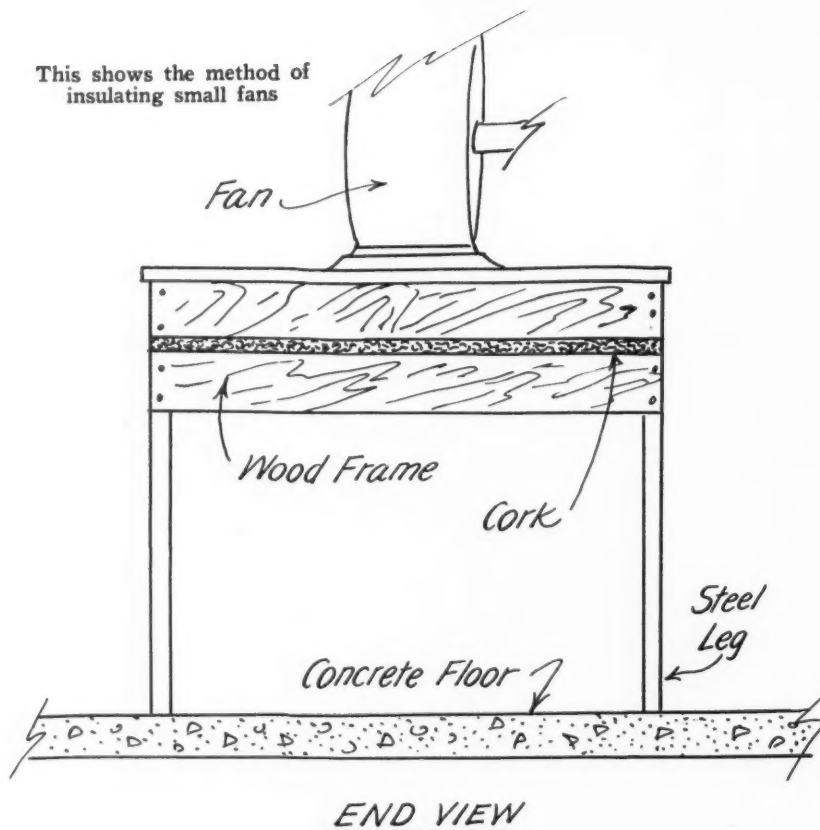
Although the form provides for transportation for men, in practice the company usually employs local

labor. A foreman goes to the job from Rapid City, and collects a working force at the point of the contract. In any year, Mr. Low finds he is helped by being able to say that local labor will be employed. During the present depression, this offer has helped him to obtain certain contracts which otherwise probably would have been lost. He even arranged with truckers at the point of the contract to go to Rapid City to bring in materials for the contract.

Coverage for his contract is taken care of by Mr. Low by a convenient contract form. It is printed on the company's letterhead and headed, "Proposal." There is blank space in the center readily to be filled in with special details, then blank spaces for the usual details of architect, location, owner, contractor, terms. Signed by the prospect it becomes a binding contract. Mr. Low has copies of this form with him, and is adept in quickly drafting a contract which covers the situation.

The estimate sheet was developed from years of experience operating over an extended trade area. The sheet includes spaces for listing railroad fare, meals, lodging, and other details encountered by this firm

This shows the method of insulating small fans



Insulation against sound penetration is always an important and interesting feature of conditioning or ventilation projects. This article explains the preventatives adopted in a large theatre.

Sound Insulating Methods For A Ventilating System

THE \$50,000 air conditioning system in the new \$1,250,000 Orpheum Theatre in Denver provides an interesting study of modern sound deadening and construction in show house ventilation work.

Designed especially for the presentation of sound pictures the theatre required not only perfection in air washing, heating and cooling, but also an absolutely noiseless job. The measures adopted were developed by the theatre construction department, company officials and the Carrier Engineering Corp. of New Jersey.

The ventilated space in the building is 300,000 cubic ft., with 770,000 cubic ft. in the auditorium proper. The auditorium has a seating capacity of 2,700, 1,400 on the orchestra floor level and 1,300 in the balcony. All help rooms, lav-

atories, etc., as well as the auditorium and public rooms, are ventilated.

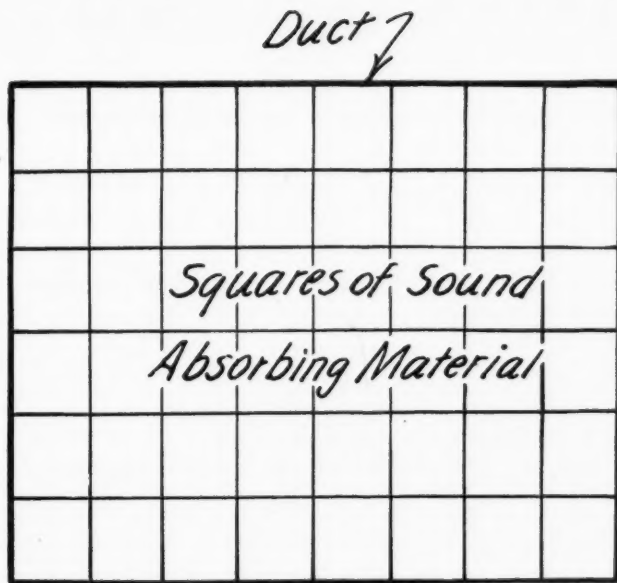
The installation makes it possible to maintain almost any desired degree of heat in the auditorium during the winter, depending on the weather, and the cooling unit is capable of lowering the temperature in the auditorium to 15 degrees below outside heat in the summer. The supply fan system circulates 65,000 cubic feet of air per minute, changing completely the atmosphere in the auditorium every 5 minutes. Temperature, humidity and volume control is entirely automatic.

Insulation for Noise

Provision was made for elimination of noise in all parts of the job by insulating both individual pieces of equipment and the rooms in

which machinery is located with sound proof materials. All pieces of moving machinery such as fans, are completely isolated, either by means of cork, canvas or other sound absorbing composition, and the discharge sides of all trunk ducts from the main supply fan are equipped with built-in type sound absorbers as shown. Machinery is all mounted on a cork base as shown in the details. In addition to this, the basement machine rooms and the air conditioning room on the projection floor level are acoustically treated with a sound absorbing plaster.

The various methods of insulating against noise transmission are shown in the detail drawings accompanying this article. In general, layers of cork are resorted to for insulation against noise caused by vibration. Fans in the system are



For lengths of 10 feet, main ducts are divided into squares, like the drawing to the left, by strips of sound absorbing material. This kills air and fan noise

air vibration is shown in a detail and consists of screens of deadening fibre through which the air is passed. These screens extend for some 10 feet in the duct and form a section which filters out all vibration of noise from air rush. Between sections of round pipe, canvas collars are fastened at the joints to break up transmission noise.

In addition to being provided

mounted on table frames with the machine base bolted to a wood framing which, in turn, is insulated from the frame by a through layer of cork.

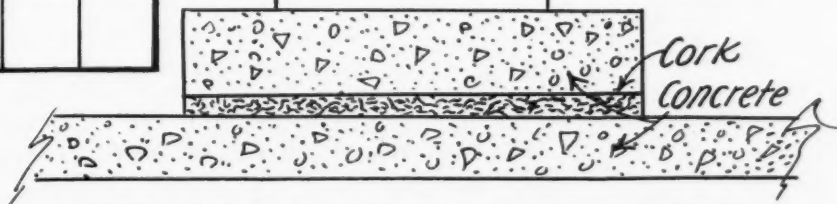
Other machines such as the ice machine are mounted on a concrete slab which is set level with the floor, but separated from the floor by a cork box which surrounds the machine slab. This machine slab extends through the floor. Lighter

machines are mounted on elevated concrete slabs which are held off the floor by a through layer of cork.

The method of insulating ducts for elimination of noise caused by

Machine Unit

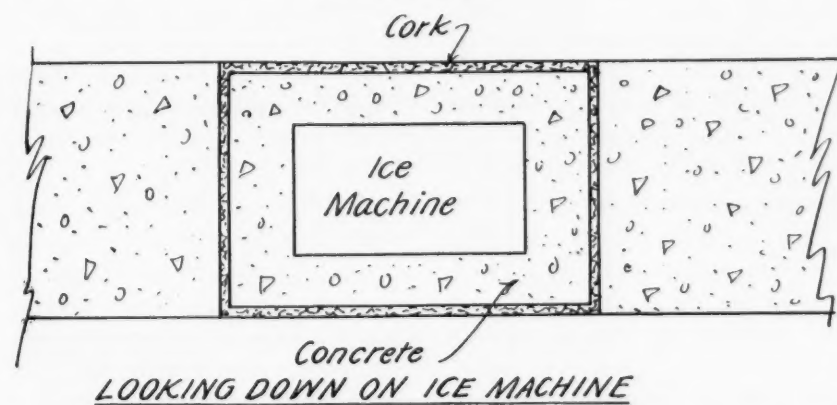
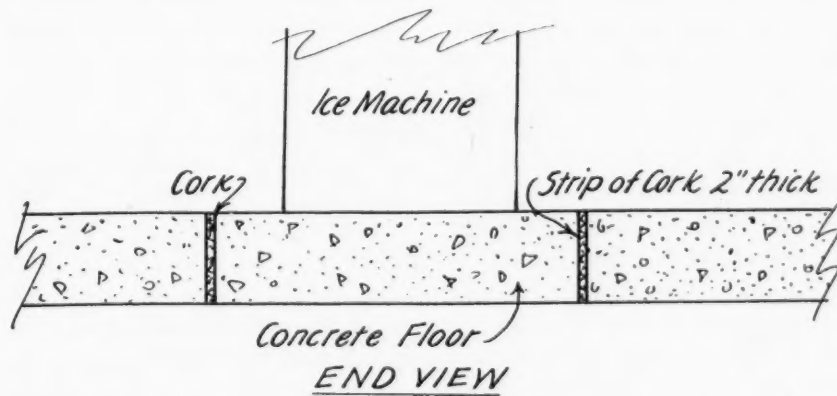
This is another type of machine mounting, for medium heavy equipment



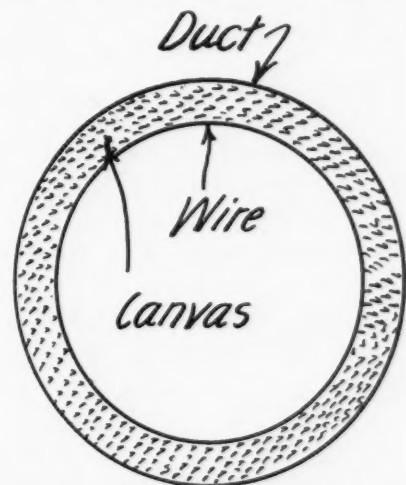
METHOD OF INSTALLING OTHER MOVING UNIT

with deflecting vanes as a protection against drafts, all grilles are damper controlled and all dampers, valves and other similar control devices have hinged access panels.

Ventilating ducts for the building range in size from 6 feet by 6 inches



Heavy machines are insulated for noise and vibration by mountings like the plan and elevation above. Structural connections to the floor cannot then transmit vibration



Round pipe joints are held together indirectly by canvas collars like this one

to 7 feet by 10 inches. The main trunk lines are insulated for conservation of heat, and all gas and water pipes in the cooling system are sound insulated with cork. All joints and other connections in the air duct system are formed on the outside of the lines, making every passage absolutely clear.

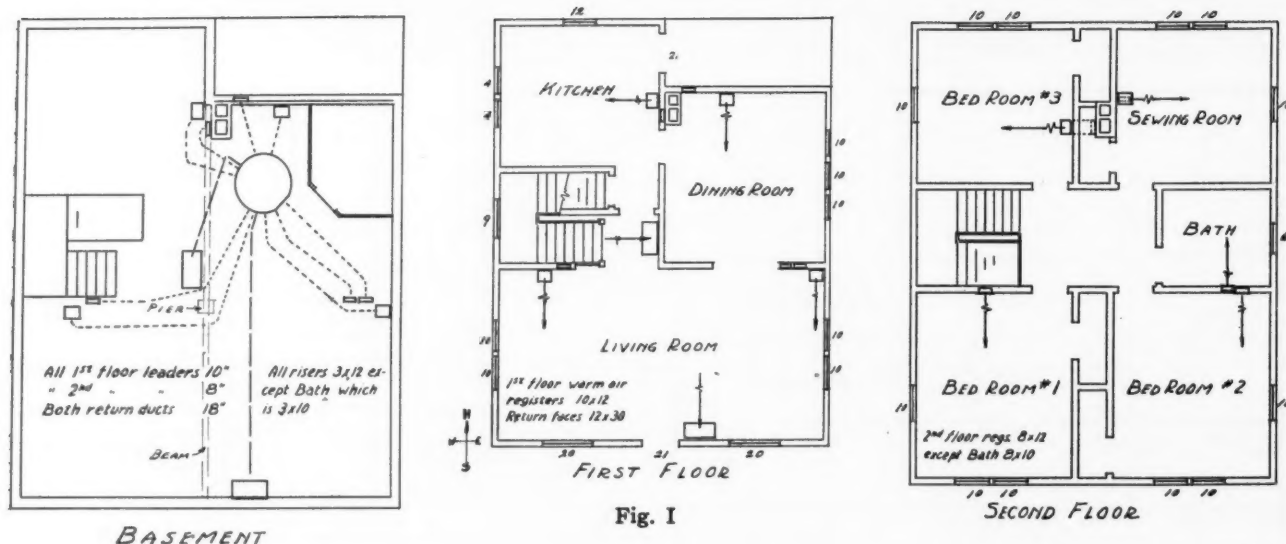


Fig. 1

In the first article of this series we selected the register air temperature for remodeling and in the second article determined temperature and air velocity from the most exposed second floor room. We must next—

Inspect, Clean and Balance The Old Piping System

As pointed out in the November issue, the gravity heating plant (Figure 1) can be converted into a mechanical system by the addition of a suitable blower and, with a register air temperature of 150 degrees and an air velocity of 500 f.p.m. in risers to second floor rooms, the existing warm air ducts are of ample size—the basement leaders more than ample in every case.

This assumes, of course, that the old pipes are to be used. Completely new duct work, however is always advisable. It looks better for one thing, and the appearance of a completed job often helps to sell another. But we are assuming in the present article, that because of cost or for some other reason, it has been decided to use the old pipes. (Like the two preceding articles of the series, this one deals only with the "hot" side of the system. Re-

turn air ducts will be considered later.)

If old pipes are to be used they must be *THOROUGHLY* cleaned. For many years past, one of the greatest objections to gravity warm air furnace heating in the minds of the home owning public, has been DIRT. We've denied it; we've argued about it; we've tried to explain it away—but that one objection has always remained. And in some localities, it has turned many jobs from circulating air to the less desirable method of heating by direct radiation. At present, we're not concerned with whether or not the complaint was justified. But for our own protection we must recognize it as an objection that has lived throughout the years and whether we like it or not, there are still thousands upon thousands of people—some of them our own friends, neighbors and customers—who continue to

think that "furnace heat is dirty."

Mechanical circulation is supposed to be—and is—one of the greatest improvements ever made in the art of warm air heating. And when we convert an old gravity plant into a modern mechanical warm air heating system, the housewife will discount all of the benefits of improved air circulation, quicker response to the varying demands of changeable weather and more uniform air temperatures if, along with these manifest advantages, there comes the undeniable handicap of "more winter dirt than she ever had to fight before."

Therefore, if experience has shown that the available vacuum cleaning equipment *might not* be equal to the task, don't take a chance. Take the basement pipes down and wash them out. If they're too far gone to stand a thorough washing, they are not in proper condition to be used

again and the only alternative is new pipes.

We can't turn a stream of water from a hose, down through a wall stack, of course, and some other means must be found for effectively cleaning the risers. If the stack is reasonably straight take a length of furnace chain a little more than twice the length of the stack, remove the register and lower one end of the chain down through the stack. Let down enough chain so that a swab of wet cheese cloth can be wired fast at the middle of the chain and, with one man at the stack head and another at the boot, work this wad of wet cloth up and down the stack to swab out the dirt that clings to the metal. After the first cloth has wiped out the worst of the dirt, replace it with a clean swab and continue. On an old job, several swabs may have to be used for every riser. All of this takes time and costs money—but it's the most effective insurance against troublesome complaints which not only endanger the customer's good will, but which also are expensive to remedy after the remodelling of the plant is finished.

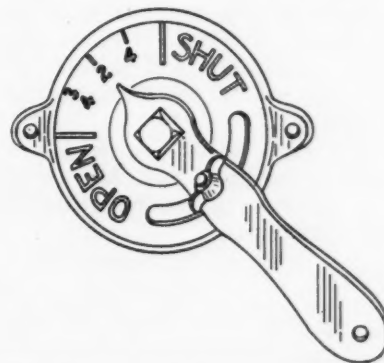
We forget too often that air flows much more rapidly through the ducts of a mechanical system

than it ever does through a normal gravity plant. Dust that lies undisturbed through the years while the job works by natural gravity circulation, will loosen gradually and spread out all through the house when a fan or blower materially speeds up the air flow unless effective steps are taken to remove it entirely from the system before the blower is added to the plant.

In addition to the leaders and risers, the registers also demand careful and thorough cleaning. An unbelievable amount of dust can accumulate in the valve mechanism of a register and again, the garden hose can be used most effectively. Lay the registers out on the ground and wash them out thoroughly with a good strong stream of water. Merely brushing and wiping them out isn't nearly enough. Ordinary vacuum cleaning of the hit or miss type isn't enough. To test the efficiency of your cleaning methods put a supposedly clean register back in place and snap the valves open and shut several times when the furnace blower is running—but until you're quite sure of yourself, don't do it while the lady of the house is around.

Instead of washing the leaders and swabbing the wall stacks,

some heating contractors have made a practice of first installing the blower without previous cleaning of the system. Then, taking the runs one at a time, they close all dampers and registers except in the particular run they are cleaning, operate the blower at high speed and let its entire capacity be confined to the one pipe. The register is care-



This is a typical damper locking device of which there are many forms on the market. Its purpose is to lock the damper after the runs have been balanced.

fully covered with damp cheese cloth to catch the dust blown out. After the loose dust has thus been blown out, they tap the leader sharply along its entire length to loosen more dirt which clings to the metal. The most that can be said for this method of cleaning is that it's better than nothing at all.

An old system can be cleaned—and it must be cleaned if your customer is to be thoroughly satisfied. Even after vacuum cleaning or washing and swabbing, it's an excellent added safety factor to cover all registers with damp cheese cloth and run the blower for several hours to dislodge and remove stray dust particles that somehow seem to escape during the previous cleaning process.

Whether old pipes are used or new ones installed, each should be equipped with a new damper, well fitted and equipped with a dial setting which can be securely locked in place after its proper position is determined. There are several locking devices similar to that shown in Figure 5.

TABLE NO. 3

Room	I	II	III	IV		V	
	Room Basic Factor	C.F.M. Measured at Room Temp. of 70 Degrees	Duct Area Sq. Ins.	Round Pipe No.	Diam. Ins.	Register No.	Free Area Sq. Ins.
Living	22.21	242	78	2	7.0	2	67
Dining	9.69	106	34	1	6.6	1	58
Kitchen	11.85	129	41	1	7.3	1	71
Bed #1	8.24	90	29	1	6.1	1	50
Bed #2	8.24	90	29	1	6.1	1	50
Bed #3	8.66	94	30	1	6.2	1	52
Sewing	9.78	107	33	1	6.5	1	59
Bath	3.96	43	14	1	4.2	1	24

Table 3 shown here gives in chart form all the information for the house we are working in. This is not a data sheet, but rather a working plan for the supply system. The use of the table is explained in full in the text of this article.

..the Problem Corner

Air Change

We have a lodge hall (upper floor) to ventilate. The room is 40 by 85 feet and 15 feet high. It is our plan to use a centrifugal type blower. The vent pipe will be direct from ceiling through roof.

How often would you suggest a complete change of air? Also let us have any other information relative to this installation.

F. H. D., Pennsylvania.

Reply by The Editors

Allen and Walker, quite generally considered an authority in ventilating, suggest at least four air changes per hour for small convention halls of the type you mention.

In your lodge hall there is an approximate total of 51,000 cubic feet and four air changes per hour means you will have to introduce 204,000 cubic feet per hour or 3,400 cubic feet per minute. The proper size of fan can be obtained from the fan manufacturers' catalogues.

As it is necessary for this exhausted air to enter the room from the outside, some means must be provided for heating. Four changes per hour is a minimum, and as we have 3400 c. f. m. at 0° to 50° to heat to 70° (room temperature) some method either by direct radiation or heating coils at outside air intake should be provided.

One method is to open windows at the bottom about 1 to 2 inches and deflect this air through the direct radiation by means of sheet iron baffles.

Some lodge halls have no windows, and an intake to the outside may be provided in which heating coils are placed. Such an intake should be placed as far from the exhaust openings as possible.

Several such intakes are better than one general opening.

Best Materials

American Artisan:

We have had quite a little discussion about which will make the most lasting job of gutter and conductor pipe—a job of ordinary copper bear-

ing 26-gage steel or 40-pound coated 26-gage long terme sheet.

R. H. V., Tennessee.

Reply by The Editors

We shall be glad to place your question in our Problem Corner and invite readers' comment gleaned from their experience with these two materials.

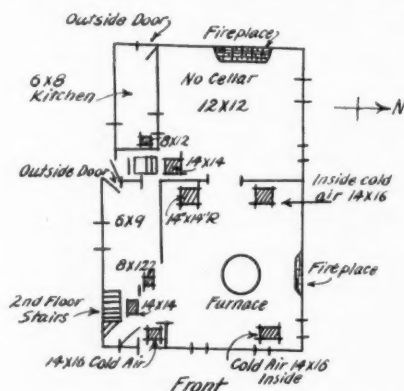
Never having followed up a job using these materials we are not in a position to give you personal views, but our readers undoubtedly will have suggestions.

What do you readers say?

Hot Furnace

American Artisan:

In the spring of 1932 I installed a furnace with five registers on first floor only in a two-story house having four unheated rooms upstairs. My calculations for furnace size were arrived at by taking the total cubage of the house and using the next largest furnace which was a 22-inch. There are two 8-inch, two 10-inch, one 11-inch leaders. There are three returns each 14 by 16 inches. One outside return has since been built to

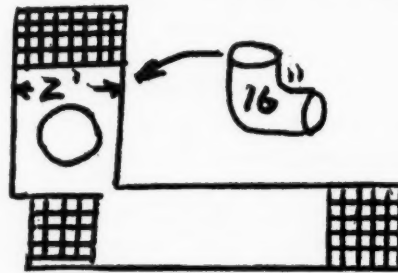


overcome the present trouble which is that the furnace casing gets sizzling hot.

The house has mud filled walls. Windows are 2 by 4 feet and the owner uses storm sash. Leaders are not long and well grouped.

On an evening with 38 degrees outside the first floor was 74 and the unheated second floor 64. By the way, there is a fireplace in the living

room and one in the dining room, both without any damper other than a board. The returns consist of floor



joist spaces which are 2 feet wide and 7 inches deep with a 16-inch elbow into the bottom of the casing.

Can you check this installation and suggest remedies for the troubles?

F. R. A., New Jersey.

Reply by The Editors

Checking over the plans and dimensions sent in we should say that instead of your furnace being oversized it is right on the line and none too large for cold weather. By Standard Code check your warm air leaders are none too large, as for example, the leader to the living room requires a 12-inch pipe where you have an 11-inch. We might suggest that you did not consider your cold ceilings and cold floors in sizing the pipe and in your house this is important.

For good practice, your cold air return pipes should be at least 10 per cent larger in area than the total area of your warm air leaders. In view of your troublesome conditions we would look to the return airs first of all. Doing so, we find that your return air is much too small. There are three 14 x 16 return faces and these open into the joist space 22 x 7 or 154 square inches. Note that all three faces are served by the one 16-inch pipe drop. As there is a total of 356 square inches of warm air pipe area, the shortage is obvious.

One large return face in the living room with a 22-inch cold air pipe to the furnace would solve the problem. The face should be 24 x 30 inches. The 22-inch return should be connected to the base of the casing with a boot not over 12 inches high, or boot 32 x 12 to 22-inch round pipe.

Vinegar Filter

American Artisan:

Can you supply me with particulars on how to make a 50-gallon filtering plant for filtering vinegar? What metal should such a plant be made of?

H. S., Mississippi.

Reply by The Editors

We regret that we cannot locate any specifications for the filtering plant you mention.

So far as metals are concerned we can say that tinned brass seems to be the metal most commonly used. However, satisfactory operation and life depends on how long the vinegar remains in contact with the metal. The special steels are being used providing the container is flushed clean every night or the container has a continuous and steady flow of vinegar.

Ordinarily we understand that the tinned brass is used until the tinning comes off when the material is replaced. We suggest that you get in communication with the special metals manufacturers, giving them full operating facts and use their recommendations.

Oil Odor

American Artisan:

We have a furnace in which an oil burner was installed some time ago. Last year the burner went haywire and flooded, the oil getting down inside the casing. The burner was removed and the oil wiped up as far as possible from the outside.

Now we are asked to remove the cement bottom inside the casing and re-cement the ring and inside area of the casing. However, there is some oil residue on the inside of the casing and inside the warm air pipes. You can see the film if you wipe your fingers over the metal. The smell of oil is bad throughout the house. We would like to know how best to get all this oil film off.

T. O. W., Missouri.

Reply by The Editors

The oil burner installers here in Chicago suggest that if oil has penetrated the cement base the base should be removed as you plan to do and re-cement with Portland cement concrete.

They further suggest that when you place the cement you get one of your mechanics inside the casing with plenty of gasoline and rags and go

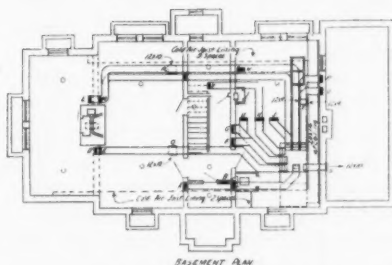
over all the metal including the leader pipes as far as the mechanic can reach.

If the odor has been very bad it is probable that the leaders are coated to the boots, in which case all runs ought to be taken down and thoroughly swabbed out.

Control Operation

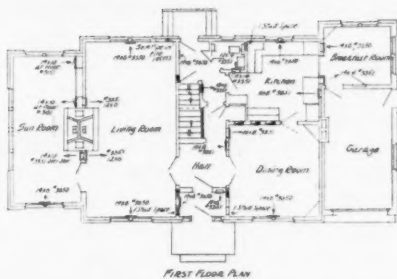
American Artisan:

Last summer we installed the system shown on the plan in a brick veneer on 6-inch tile and with plaster direct on the tile. The trouble is this—the temperature in the breakfast room is always about 15 degrees



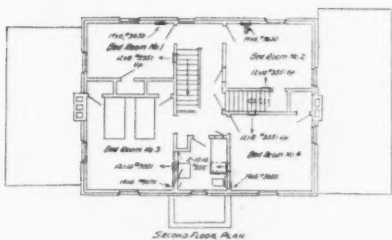
lower than the other rooms. Also the second floor rooms are usually 10 degrees lower than the first floor.

The register in the breakfast room is set in a 4-inch tile wall, but the back of the register is insulated with two layers of asbestos, metal lathed and plastered. This pipe runs over a cistern which is covered with a con-



crete slab. Above the slab are 2 by 6 joists with a 1-inch opening between the slab and the bottom of the joists which permits air to circulate through this space.

In cold weather whenever the blower starts the washer also starts and the humidity reaches 55 per cent although our humidistat is set at "low."



If we put the thermostat in the breakfast room we think the other

rooms will be over-heated. What can you suggest?

W. H. B., Minnesota.

Reply by The Editors

Looking over your plans we can suggest only one economical remedy. We would deal with this job as though it were a remodeling proposition. The breakfast room then becomes our critical room and we can do two things to raise its temperature—increase the register air temperature or increase the c. f. m.

Our suggestion would be to place the thermostat in the breakfast room, set the register air temperature for satisfactory heat at the available c. f. m. and then volume the remainder of the rooms to meet each room's requirement.

Blower Size

American Artisan:

We are asked to estimate on a blower for a two-room school. The building is heated with a 28-inch furnace. There are two 22-inch cold air returns and two 22-inch warm air pipes. The building has enough heat now, but the air gets stuffy. Each room is 33 feet long and 18 feet wide with a 12-foot ceiling.

We would like to know what size blower is required; what size pipe from the outside and how many air changes are required by the code in our state. Should the furnace be baffled?

Z. B., Wisconsin.

Reply by The Editors

The Wisconsin Ventilation Code for School Houses calls for a supply of 2 cubic feet per square foot of floor area in class rooms. Hence, if the rooms are 18 x 33 equals 594 square feet times 2 equals 1,188 cubic feet per minute per room or a blower with a total capacity of 2,376 c.f.m. This would give each class room a 6 minute air change.

The code allows a 50 per cent recirculation of air, hence, $\frac{1}{2}$ of 2,376 or 1,188 cubic feet of air per minute may be recirculated. For mechanical systems the code calls for 1,000 ft. velocity at the outside air intake, but as we will assume that this system will function on gravity at times we will set the velocity at 500 feet per minute and 1,188 divided by 500 equals 2.37 square foot in duct from outside or round duct 20 inches in diameter approximately.

The furnace need not be baffled, but a bonnetstat should be installed to prevent cold air from passing into the class room.

The 1934 Roofing and Sheet Metal Industries Conference

THE 1934 conference of the national roofing and sheet metal industries held February 5 to 9 in New York will probably go down in history as the most important conference our industry ever held.

The primary purpose of the conference, as most readers understand, was to determine the methods of procedure to be followed under the National Recovery Act Code for the construction industry. Most readers will understand, we are sure, that the basic code of fair competition for the construction industry, being Chapter I of the group of codes for all types of contractors following the building industry, has been approved by General Johnson and signed by President Roosevelt. Under this basic code there are individual codes for each of the 21 sub-divisions of the construction industry and of this group the divisional code for the roofing and sheet metal contracting group is divisional code No. 7.

In view of the widespread interest in this conference and believing that readers will be interested in knowing just how the provisions of the code were thrashed out, we propose in this report to give a chronological resumé of the most important happenings of each day of the conference.

We feel that this type of report will be interesting because it will explain just how much discussion was required to settle points of controversy.

Monday

Prior to the conference a committee had been appointed to decide on conference details; to arrange the work to be done on the code; to discuss and decide on recommendations to be made before the conference.

This committee reporting on the first day declared that according to Washington all men in the trade, whether code or association members or non-members, are eligible to vote for the National Code Authority Committee. This ruling was passed out by the Law Department of the NRA.

At the first session the built-up roofing contractors of New York and Chicago served notice that they would not abide by the code since they objected to the guarantee clause.

It was announced that officers of the American Federation of Labor would address the convention on

Tuesday. Officers of the National Sheet and Tin Workers of Cleveland, Ohio, asked for an opportunity to address the conference and were given two tentative schedules. This request caused considerable objection, but the wish of the conference was to give every interested party fair and adequate representation, hence the allotment of time to union representatives.

Three possible methods of getting fair representation for the entire country on the National Code Authority Committee were discussed. These three tentative methods were: 1, by Federal Reserve districts requiring nine members; 2, distribution around fourteen centers of population; 3, using existing state or state-group trade associations and giving such associations as much territory as they can handle.

Tuesday

The Board of Directors of the National Sheet Metal Contractors Association discussed applications for membership; cost of preparation of the code and how to finance the expenditures made to date. Until the code is signed financing of expenditures must be made by voluntary subscriptions and after the code is signed it is debatable whether financing can be assessed against all members of the industry. Having no definite ruling this problem was referred to National Recovery Administrator King.

For purposes of selecting representation on the National Code Authority Committee the conference discussed the possibility of dividing the country into Chamber of Commerce Divisions as follows:

1. Metropolitan New York, covering the radius of sixty miles, and extending as far north as Bridgeport, Connecticut.
2. New England as far south as Bridgeport, Connecticut.
3. Eastern Pennsylvania, Maryland, southern New Jersey, Delaware.
4. Indiana, Illinois, Michigan Peninsula, Minnesota, Iowa, Wisconsin, Kentucky.
5. Western Pennsylvania, Ohio, Northern Maryland, West Virginia, Michigan.
6. Virginia, North and South Carolina.
7. Tennessee, Mississippi, Alabama, Georgia, Florida.
8. North and South Dakota, Nebraska, Wyoming, Montana.
9. Colorado, Kansas, Western Missouri.

10. Arkansas, Oklahoma, Louisiana, Texas, New Mexico, Eastern Missouri.

11. Washington, Oregon, Idaho, Utah, Nevada, Oregon, California.

Many changes in the above grouping were suggested by local representatives who wished to be included in other districts. Definite decision on these objections were laid over for decision by the Code Authority Committee, when elected.

Under this suggested representation each section was to have a regional director appointed by code members in the zone; each zone to nominate and elect its own code authority member, after which names to be placed on a ballot and the convention to vote on the names suggested.

Considerable discussion was had on provisions of the code and suggested changes were made in several sections of the code. These changes cannot be made definitely until the code is approved and signed.

Union officials refused to appear before the convention and agreed to meet only with union shop employers. At this meeting the maximum 30-hour week; minimum rate for skilled labor; graduated rates for apprentices and beginners were discussed. The union representatives declared for 90-cents to \$1.00 per hour for skilled labor; 75-percent of the skilled labor wage for apprentices; 40-percent of the apprentice wage rate for beginners; beginners to be advanced on the average of 5-cents per hour every six months of employment. The union shop employers said this matter must be thrashed out before the convention and that they could do nothing by themselves. Union officials were directed to wait for the return of Administrator King, who was called to Washington.

It was the consensus of opinion of the convention that wage rates must be left to the zones or to the local committees for settlement.

Wednesday

At a meeting between union labor delegates and union shop employers held Tuesday evening the labor delegates agreed to withdraw all objections to mechanics, apprentice and beginner rates if the association would appoint a committee of union employers to meet with the labor representatives and arrange a plan whereby col-

lective bargaining could be established in all parts of the country. This motion was tabled.

The New York City representatives reported that all union agreements expired February 1, 1934 and that the New York group had offered: \$1.00 an hour for outside skilled labor; 75 cents per hour for inside skilled labor; no traveling time allowed or carfare; \$1.12½ per hour for slaters. The New York representatives reported that no agreement had been made with the union.

Considerable discussion was held on the possibility of establishing a \$2.00 or \$3.00 membership due for a firm joining as a member of a local or state association. No action was taken.

Reports from representatives from many parts of the country were submitted and delegates were asked to give a brief resume of their association's activities, how their membership drives are progressing and what, generally speaking, is the most pressing need of local groups.

Warm Air Heating

H. T. Richardson, President of the Warm Air Heating and Air Conditioning Association reported that 85-percent of the manufacturers have signed the code; 13½ percent are ready to sign; leaving only 1½ percent outside the code. President Richardson also declared that under an arrangement made between mail order houses and manufacturers prices to mail order houses will average 15 percent higher than prices to the trade. He further emphasized that under the furnace manufacturers code direct distributing manufacturers must choose whether they will act as manufacturers or as dealers and installers and that if they install they must comply with the installers' code.

Figures compiled by the Warm Air Heating Association indicate that at the present time 82 percent of all furnaces are sold by the dealers; 8 percent by mail order houses and the remainder is undetermined.

According to the code jobbers cannot have a department for installing or if they insist on installing they must organize a separate company and the installing company is not permitted to use jobber prices on equipment for installers.

During the roofing and water-proofing session the so-called "re-roofers" introduced a resolution declaring they wanted a separate classification, but according to the regulations of the code re-roofing is included in the code for roofers. Since this meeting did not

have any authority the subject was killed.

A typical example of controversies to be settled, occurred in a wrangle between Baltimore union and non-union shops and indicative of future operation was the decision that this argument must be settled locally between the two classes of operators.

Additional discussion in the main conference was held in the afternoon on the matter of determining zone areas and the election of members to the National Code Authority Committee. Regardless of how the country is to be divided each zone must agree on an appointee to the National Code Authority Committee before final election can take place and this problem resulted in considerable argument over the individual to be selected by the various zones.

Thursday

The first business of the day was the election of officers for the National Association of Sheet Metal Contractors for 1934 as follows:

President—Max Leiber, Ambridge, Pa.

1st V. P.—William Feiten, Cleveland, Ohio.

2nd V. P.—George Brown, New York.

3rd V. P.—T. F. Handley, Chicago, Illinois.

4th V. P.—Jack Stowell, Aurora, Illinois.

Treasurer—Joseph C. Gardner, Indianapolis, Ind.

Sergeant—H. G. Harline, Erie, Pa.

I. P. Pres.—Harry Stanyer, Dallas, Texas.

DIRECTORS

George Harms, Peoria, Ill., L. M. Lathers, Athens, Ga., William Bush, Detroit, Mich. (for three years).

In order to facilitate election of members to the National Code Authority Committee decision was made to restrict the number of members to eleven, and the country was divided into eleven zones as follows:

1. New England Zone; Maine; New Hampshire; Massachusetts, Rhode Island, Connecticut to Bridgeport; Vermont.
2. New York State.
3. Metropolitan New York; Northern New Jersey; Connecticut to Bridgeport, inclusive.
4. Eastern Pennsylvania; Southern New Jersey; Delaware; Eastern Maryland, including Hagerstown; Washington, D. C.
5. North Carolina; South Carolina; Virginia.
6. Tennessee; Florida; Alabama; Mississippi; Georgia.
7. Western Pennsylvania; Ohio; Michigan except Peninsula; West Virginia; Maryland, west of Hagerstown.

8. Indiana; Illinois; Wisconsin; Michigan Peninsula; Iowa.

9. North and South Dakota; Nebraska; Wyoming; Montana.

10. Texas; New Mexico; Oklahoma; Arkansas; Louisiana.

11. Washington State; Idaho; Utah; Nevada; California; Oregon; Arizona.

Colorado, Kansas and Missouri were not allotted since these states were not represented at the conference.

Code Representatives

The various zones finally elected their candidates as follows:

Western Zone: D. A. Jackson of Los Angeles, California. Roofing, Waterproofing and Re-roofing.

Southwestern Zone: H. Stanyer of Dallas, Texas. Sheet Metal, Warm Air Furnace, Slate and Tile Roofers.

North Central Western Zone: Walter Miller of Kansas City, Missouri. Slate and Tile Roofing.

Central Western Zone: A. W. Wendt of Chicago, Illinois. Heating and Ventilating and Sheet Metal Worker.

Ohio Valley Zone: W. C. Markle of Pittsburgh, Pa. Sheet Metal Work, Ventilating and Air Conditioning.

Southeastern Zone: B. L. Hinkle, Birmingham, Ala. All branches but re-roofing with asphalt shingle and re-siding.

Tri-State Zone: Walter Budd of Durham, No. Carolina. All branches.

Pennsylvania-Maryland: Roy Eichberg of Philadelphia, Pa. Sheet Metal, Heating, Ventilating and Air Conditioning.

Metropolitan New York: George Brown of New York City. Sheet Metal, Slate and Tile.

New England: Charles A. Earley of Boston, Mass. Sheet Metal and Roofing and re-roofing with asphalt shingles.

New York State: J. Boyd Griffiths, Binghamton, New York. All branches but heating.

Ballots and proxies were deposited for counting by a specially appointed committee to report the last day of the conference.

It might be well to state that the eleven zones listed above are for the purpose of electing National Code Authority Committee members, and are not final operating zones.

As organized at present, the suggested procedure is for local controversies to be taken first before the local committee. If this committee cannot pass on the controversy it refers the matter to the zone committee which in turn can take the controversy

before the National Code Authority Committee. Members of local code committees must be elected by individuals in the zone.

Deputy Administrator King returning from Washington declared the administration considers the election of code Authority members a regular proceeding even though the code is not signed. He suggested that the complaining re-roofing group file a brief before the National Code Authority Committee for a ruling on the definition of their trade and any matters pertaining to wages, guarantees, etc. Mr. King was asked to give a ruling on the guarantee and bond for roofing and slate contractors. These two groups were ordered to present a brief as soon as possible.

The conference went on record to continue the roofing and sheet metal industrial conference for another year and to elect officers and nine vice-presidents, treasurer and a secretary, with the vice-presidents representing all branches of the industry including jobbers. This recommendation was tabled.

Numerous objections and points of order were introduced during the sessions such as—the conference was not representative of all contractors; election of code authority committee not in order as the code is not signed; etc. So far as possible each objection was thrashed out and a decision made leaving only such points as finances and elections for decision on the last day. The problem of expense money of delegates was discussed and it was decided that either divisional or local administrative code committees upon appointment can distribute bills to all members of the industry within their jurisdiction.

Friday

The states of Colorado, Kansas, Missouri, were declared included in the North Central zone under Walter Miller of Kansas City.

The Roofing and Sheet Metal Industrial National Conference was voted to continue for another year, with the same officers.

The final changes recommended for the code are:

Chapter VIII, Article 1. Definitions.

F. Sheet Metal and Allied Work was changed and sent to the Law Department for approval.

G. Coppersmithing to be reworded by Administrator. Decision to be rendered on Hotel and restaurant equipment, (this later was, as manufacturers, probably misplaced and understood to be in our Code, but was intended for Fabricated Metal Code.)

Puttyless Skylight manufacturers asked for representation on National Code Authority Committee. It was stated that 85 percent of these manufacturers fabricate and install.

The re-roofing group after several conferences, one including Administrators King and Dussenberry, agreed to go along as at present and give the present set-up a trial and if then they find it not satisfactory, they may ask for a definition and representation on National Code Authority.

Chairman Griffiths stated for Deputy Administrator Dussenberry that any trade sub-division which finds itself not adequately represented or defined may make application to Code Authority Committee for a change, even after the Code is signed.

Jack Stowell of Aurora, Ill. was unanimously elected a member of the National Code Authority, as representative at large for Warm Air Heating (making 12 on committee).

Each member of the N. C. A. was asked what parts of the business he covered, and among the twelve, every part of the trade and subdivisions are covered; in other words, some one, two, or three really included in their work every part of the business including coppersmithing and hotel and restaurant equipment. This seems to be a very representative committee.

Roofers

The United Roofing Contractors Association of North America met and elected the following officers: (Flat roofing, etc.): President—R. S. Pitts, Newark, N. J.; 1st V. P.—John J. Hesson, Louisville, Ky.; 2nd V. P.—Thos. B. Breen, New York City; secretary and treasurer—E. M. Pope, Chicago, Ill.

Directors—Jos. E. Piper, Greenville, S. C.; J. Boyd Griffiths, Binghamton, N. Y.; D. A. Jackson, Los Angeles, Cal.; I. A. Lange, Milwaukee, Wis.; Jas. C. Simpson, Dallas, Texas; Walter H. Miller, Kansas City, Mo.; George Cartier, Providence, R. I.; A. Chevalier, Philadelphia; A. T. Golden, Scranton, Pa.; H. W. Morgan, Buffalo, N. Y.; Mark A. Cronin, Chicago.

The balance of the day was spent on a conference with Mr. King; Mr. Dussenberry and Mr. Hodd (NRA attorney).

Mr. Hodd speaking on Code Compliance said:

"This trade compliance must be considered from three different angles: 1. Fair trade practice; 2. Labor provisions under 7a; 3. Labor disputes (strikes or lockouts).

"If the employers want to handle

questions in their locality they must set up a Trade Practice Complaint Committee; equally divided between employers; employees and appointments by administrator. An Executive Secretary is very necessary; one who may be reached by individual employers and employees. Each local committee should have an attorney.

"The local code administrative committee may be set up as local, state or zone. Experience has proved that the large majority of complaints have no foundation and can be settled by local authorities or by a smaller committee from the local and having an equal number of employers and employees as a fact finding committee to settle problems at the source or refer to whole committee. If the local committee or the local authority cannot settle the controversy the matter is referred to the whole National Authority Committee, and then to the NRA Deputy Administrator, who will have an office in the area (five of these offices in U. S.) and an adjuster will be sent.

"Each Local Administrative Authority Committee must set up its rules and regulations and committees and refer these to member of National Code Authority for approval of Deputy Administrator, specifying names and addresses, etc."

Said Mr. King: "A new eagle in two colors with Roofing & Sheet Metal Industry printed on it and with a registered number on each one for each shop will be supplied when a shop consents to do business under the Code and NRA. Registered number is recorded.

"Suits by Code Authority should not be brought until approved by NRA at Washington which may turn it to Department of Justice or Trade Commission.

"This plan will be blue printed and sent to all local authorities."

Decision on collection of funds was left to the National Code Authority Committee to plan, after many suggestions were offered. Each association secretary will be required to furnish Secretary Markle with a description of his Association, number of members, dues, officers and the number of shops that have signed the Certificate of Compliance, and whether it can handle the Code.

The one question that cropped up throughout the week and seemed to be of much importance to associations in all localities was:

"If a shop does **not** sign the Code; nor join the association, and declare they will not have anything to do with the NRA, how can we collect his part

(Continued on page 50)

The Roofing and Sheet Metal Contracting Code

This code for the sheet metal and roofing industry is the code awaiting President Roosevelt's signature. Any changes made during the conference held in New York will be reported in later issues.

CHAPTER VIII ROOFING AND SHEET METAL CONTRACTING DIVISION

ARTICLE I DEFINITIONS

Section 1. The term "Roofing and Sheet Metal Contracting Division," or "this Division," as used herein shall include the contracting for and:

A. 1. The furnishing, installing, applying, repairing, re-roofing and servicing or maintenance of roofs on which sheet metal, slate, tile, asbestos and/or asphalt shingles, composition or membrane roofing, asbestos or other roll roofing, insulation and other special treatment of roof surfaces, is required; and the furnishing, erecting and applying of sheet metal, slate, tile, asbestos or asphaltic materials used for siding on any building or structure.

2. The handling and laying of plastic sub-flooring such as asphalt, mastic asphalt, and tar concrete floors or sidewalks except those made of similar materials which are preformed and laid in Portland cement grout.

B. 1. The waterproofing of any or all exterior or interior portions of any type of structure below or above the ground surface with any type of material, such as asphalt, pitch, felt, cotton, cement, chemically treated iron, etc., and applying the necessary protection courses; except the integral waterproofing of mass concrete.

2. The waterproofing of bridges, viaducts, abutments, dams or any other type of non-habitable structure, spandrel beams, columns or any other structural members with any type of material, and including the cutting, pointing, caulking and application of waterproofing compound; except the integral method of waterproofing mass concrete.

C. The dampproofing of the interior surfaces of walls of any type of structure with any type of material which may be applied in the fluid or semi-fluid state, whether or not reinforced with fabrics, felts or like material.

D. The caulking with any or all types of materials of door and window frames as well as the installation with any and all types of materials of expansion joints in connection with waterproofing on any and all types of structures.

E. Any and all insulation of any and all types of material incident to the above-mentioned work.

F. The fabricating, furnishing, erecting, installing, applying, repairing, servicing or maintaining of sheet metal work of No. 10 U.S. or its equivalent or lighter gauge required on or in buildings, and structures, including, among others, metal ceilings, warm air furnace heating systems and air conditioning and cooling systems used in connection therewith; sheet metal work in connection with heating, ventilating and air conditioning systems, including the mechanical apparatus and equipment when included in the sheet metal contract; blow pipe and exhaust systems, including the mechanical apparatus and equipment; and sheet metal products and equipment used in or for industrial plants, and for agricultural and domestic use.

G. The fabricating, furnishing, erecting, installing, applying, repairing or servicing of sheet metal work in connection with food service and beverage equipment including the copper-smithing branch but excepting prefabricated equipment and accessories.

Section 2. The terms "contractor" and "member of this division," shall include anyone engaged, wholly or in part, in this division as defined in Section 1 of this Article.

ARTICLE II WAGES AND HOURS AND GENERAL LABOR CONDITIONS

Section 1. Notwithstanding the provisions of Section 2. A. of Article III of Chapter I hereof, the following provisions as to minimum wages shall apply to the following classes of employees in this division:

(a) **Apprentices.** An apprentice with over one year's service shall be paid not less than forty per cent (40%) of the minimum wage established for the class of worker he is engaged to assist.

(b) **Beginners.** A beginner in his first

year's service shall be paid not less than seventy-five per cent (75%) of the minimum wage established for an apprentice.

Section 2. The minimum rates of wages shall apply with equal force to any contractor who works with tools, and he shall charge his time so occupied at said rate to each job, as though he were an employee.

Section 3. An employer shall make payment of all wages as due, in lawful currency, or by negotiable check payable on demand. Employers and their agents shall accept no rebates directly or indirectly on such wages, nor give anything of value to any person for the purpose of influencing rates of wages or the working conditions of their employees. Wages shall be exempt from any payments for pensions, insurance, sick benefits or any other form of benefit or rebate, other than those required by law or voluntarily agreed to.

Section 4. **Maximum Hours.** Salesmen, estimators, kettlemen and truck drivers are exempt from the maximum hourly limitations provided in Section 2. B. of Article III of Chapter I hereof.

Any employer shall be subject to the applicable maximum hourly limitations provided in this Code in respect of the performance by him of manual labor or mechanical operations customarily performed by employees.

Section 5. **Safety Provisions.** Employers shall make reasonable provision for the safety of their workmen, at the place and during the hours of their employment, and shall comply with all national, state, or local laws or ordinances referring to safety measures in so far as the same may apply to their work.

Section 6. Employers shall post, in shops and offices, the labor provisions of this Code as they apply to this division.

ARTICLE III ADMINISTRATION

Section 1. **Administrative Agency.** A Divisional Code Authority is hereby constituted to administer this Code within this division to consist of nine individuals, or such other number as may be approved from time to time by the Administrator, to be elected by the Roofing and Sheet Metal Industries' Conference. The initially selected members of the Divisional Code Authority shall be elected at the 1934 meeting of such Conference (but not later than February 15th, 1934) from nominations presented at such meeting by members of this division, or any subdivision thereof. In the election of the Divisional Code Authority the Conference shall give due consideration to representation in respect of geographical location and in respect of the various sub-divisions of this division.

Section 2. The Divisional Code Authority shall have, in addition to the powers and duties conferred upon it in Chapter I of this Code, the following further powers and duties:

(a) To use such trade associations and/or other agencies as it deems proper for the carrying out of any of its activities provided for herein, provided that nothing herein shall relieve the Divisional Code Authority of its duties or responsibilities under this Code and that such trade associations and agencies shall at all times be subject to and comply with the provisions hereof.

(b) To make recommendations to the Administrator for the co-ordination of the administration of this Code with such other codes, if any, as may be related to this division.

ARTICLE IV FAIR TRADE PRACTICE REGULATIONS

Section 1. For the protection of the public, this division recommends that a contractor should have the following qualifications:

(a) Be generally qualified by his technical training, and/or experience in the industry to direct properly the application, installation, erection, or repairing of roofing, waterproofing, and/or sheet metal work as required in the construction industry.

(b) Be an employer of journeymen roofers and/or sheet metal workers, and protect his employees by compensation insurance and the public by public liability and property damage insurance.

(c) Have an established place of business,

be financially able to operate his business properly, own the necessary tools and equipment required in the performance of the work in which he specializes, and maintain a set of books, methods of accounting and records.

Section 2. (a) The Standard Form of Contract Documents of the American Institute of Architects is recommended to be the basis to be used for all contracts.

(b) When methods of doing sheet metal work are not clearly shown on drawings or defined in specifications prepared by architects it is recommended that methods shown in "Standard Practice in Sheet Metal Work," published by the National Association of Sheet Metal Contractors of the United States, Inc., be used; for slate roofs, methods shown in "Slate Roofs," published by the National Slate Association; for composition or built-up roofs, the specifications approved by the United Roofing Contractors Association of North America, and any other standards of practice as may be approved by the Divisional Code Authority.

The following Sections of this Article IV are unfair trade practices, and are prohibited:

Section 3. No member of this division shall submit an estimate price on any job, or submit a bill for his services without retaining the actual and correct cost record thereof.

Section 4. No member of this division shall sell or offer to sell labor, materials, and/or services below the cost thereof.

For the purpose of this section, cost is defined as the cost of direct labor plus the cost of materials plus overhead as shall be determined by cost accounting methods recognized in the industry and approved by the Divisional Code Authority and the Administrator.

Section 5. No member of this division shall use or substitute materials inferior in quality to those specified by the purchaser without the consent of the purchaser.

Section 6. No member of this division shall use methods of fabricating, applying, or erecting work not in accord with the applicable governmental laws, rules and regulations, or building codes in force in the territory affected.

Section 7. No member of this division shall induce or attempt to induce the breach of a contract between a competitor and his customer.

Section 8. No member of this division shall make, cause, or permit to be made or published any false or deceptive statements concerning the business policies, credit standing, ability to perform work, or labor conditions of a competitor.

Section 9. No member of this division shall give, permit to be given, or directly offer to give, anything of value for the purpose of influencing or rewarding the action of any employees, agent or representative of another in relation to the business of the employer of such employee, the principal of such agent or the represented party, without the knowledge of such employer, principal or party. Commercial bribery provisions shall not be construed to prohibit free and general distribution of articles commonly used for advertising except so far as such articles are actually used for commercial bribery as hereinabove defined.

Section 10. No member of this division shall place blanket orders or future delivery contracts for the same material for a specific job for which he has the contract, with more than one concern when the total so ordered is in excess of the material required for such job. Future delivery orders or contracts for specific jobs shall contain sufficient information to identify definitely the job for which the orders are placed.

Section 11. No member of this division shall undertake to complete a contract or job upon which another contractor has temporarily stopped work because of nonpayment of amounts properly due.

Section 12. No member of this division shall accept or give securities, bonds, mortgages, stocks, promissory notes, or other personal or real property as whole or part payment for work or material, at other than the fair market value thereof, to be determined in doubtful cases by independent and competent appraisal.

Section 13. No member of this division
(Continued on page 24)

The Wisconsin Convention

THE Twentieth Annual Convention of the Sheet Metal Contractors Association of Wisconsin, held February 5 and 6 in Milwaukee, seemed indicative of the spirit of progressiveness and activity which has become apparent in all association activities.

Departing from past practice, the Wisconsin Association staged a display of manufacturers' equipment in connection with the convention with products of seventeen manufacturers and jobbers in the convention hall.

The 1934 convention program was designed specifically to cover questions of importance, discussed by speakers of national reputation and experience.

Air Conditioning Session

Four addresses of interest and importance were delivered during the air conditioning session. "How to Sell Air Conditioning Equipment" was discussed by I. W. Rowell, Lakeside Co. "The prospects for air conditioning equipment," declared Mr. Rowell, "are limited only by the number of home owners in the country. Taking government figures, we find more than 22,000,000 one-family and 2,000,000 two-family dwellings in the country. All these owners, excepting those who have already purchased air conditioning equipment, are prospects for the products and service of our industry.

"That air conditioning can be sold is indicated by a survey of contractors from Maine to California and taking one contractor from each of twelve states we find that these twelve contractors have been responsible for the sale of more than one-quarter million dollars worth of air conditioning. These contractors are in no way different from thousands of other contractors excepting that they may be willing to work a little longer or a little harder.



George Bishoff, President

"It is safe to say that an average air conditioning system giving circulation, heating, cleaning, humidification and perhaps some form of cooling will cost home owners at least \$1,000. If we reduce this \$1,000 to \$500 we find that there is a potential \$1,000,000,000 market each year for air conditioning sales.

"This market does not include sales possibilities in barber shops, stores, offices, beauty parlors, etc.; a field which can easily use another \$1,000,000,000 worth of service.

"The assertion has been made that the warm air furnace con-

tractor is one of the world's poorest merchandisers, but I say that this statement is not correct and that any one who is willing to sell can sell. I sometimes think that the vast amount of publicity given air conditioning is tending to make contractors lazy. Air conditioning is not bought. The customer must be sold. We have equipment of advanced design and the biggest problem today is to impress on dealers the necessity to sell."

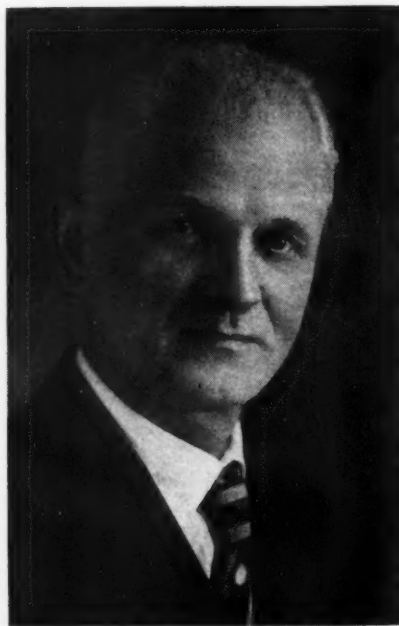
The practical design of a mechanical warm air heating system was covered by G. A. Voorhees, Lakeside Co., who distributed to those attending copies of a special engineering bulletin in which the principal points of technical and installation problems were set forth.

Engineering

A limited number of additional copies have been made and contractors interested in a bulletin of this type may secure a copy by writing to the Lakeside Co.

Two interesting short-cut methods of design were stressed by Mr. Voorhees. The principal discussion centered around a chart based upon the Third Edition of the Mechanical Code and so arranged that the contractor, by laying a rule across the chart, can determine from the total heat loss of any space the duct area in square inches required for velocities from 400 to 1,000 f.p.m. at register air temperatures from 130 to 160 degrees and at the same time secure the cubic feet of air per minute handled by the piping system.

Some high-lights of cleaning equipment sales were presented by F. L. Myers, Owens-Illinois Glass Co., "Up until 1929 we might call the air conditioning industry a buyer's market," said the speaker, "but this condition has changed and since 1930 the market has become a selling market.



Paul Biersach, Secretary

Despite this change contractors' operations prove that the industry can sell air conditioning providing it can learn how to explain the benefits of air conditioning in understandable language.

"We ought never overlook the fact that 75 per cent of the buyers of air conditioning equipment are women. Women understand comfort and are seldom interested in construction features. Undoubtedly one of the things of most interest to women is the matter of cleanliness and this approach has been found to be the easiest method of interesting women in the advantages of air conditioning.

"It seems as though contractors have not organized their thinking to the extent of appreciating that \$50.00 a week mechanics and \$15.00 a week salesmen is not a sound operating basis. While we cannot say that these salaries should be reversed we can say that a better type of salesman will return more benefit to the contractor than an equivalent increase in mechanics' wages." Mr. Myers gave some preliminary information on the data to be secured from the Owens-Illinois test house in Toledo and outlined the method of presenting these test results to the contractor just as rapidly as the results are obtained.

Controls

An interesting discussion of automatic control was presented by John F. Jaap, Cook Electric Co., who used a blackboard to point out that the progress in control equipment and use can be directly charted by three graph lines which show the leveling out of temperature lines through the three important stages of the development from the manually controlled damper and check through automatic draft and check operation up to the final stage wherein all equipment and operation are synchronized to give a practically horizontal line.

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Mr. Jaap cited an interesting experience in visiting the Field Museum in Chicago wherein is pictured man's progress through the ages. "This museum display indicated," said the speaker, "that one of the principal aims for the last ten thousand years has been the securing of comfort through the use of fire. How far we have progressed is indicated by a comparison between the methods of heating during the long period prior to fifty years ago and the much shorter period from fifty years ago to now."

A display board on which was mounted typical equipment was used to show how really simple has been made the installation of present-day equipment.

A very interesting history of forty years of service in the sheet metal industry was related by C. F. Warning, Oshkosh contractor, who declared that he resented the statement that there was little romance in the sheet metal field. Mr. Warning related his experience as an apprentice forty years ago and explained how thorough was the training given apprentices and mechanics at that time. "I believe that one of the things our industry needs most is a return to the condition wherein apprentices and young mechanics are given the same thorough training that we secured back in the days when the sheet metal contractor was known as the tinner and the tin shop was the source of home owners' supply for such items as tin pails, boil-

ers, cans and other home utensils," declared Mr. Warning.

The era of the tin roof, tin gutter and tinware was pointed out by the speaker who declared that there has never been any better material for roofs than a good grade of tin. "Tin roofs and tin utensils lost standing because competition forced contractors to use poor mechanics to lay tin roofs with a cheaper grade of metal, to use fewer cleats, fewer nails and one pound of solder where four pounds should have been used.

Cornice Work

"Identically the same situation occurred in the metal cornice and this field, which thirty years ago was a very important factor in the operations of the average sheet metal shop, passed out of the picture because contractors either would not or could not install good cornices." Mr. Warning cited numerous examples of cornice work which he had personally inspected wherein the lookouts were placed by the mason and the cornice sections were nailed to these lookouts irrespective of height or projection and sections were nailed rather than riveted and soldered.

The speaker declared that unless the industry watched its step many of these ills will creep into the design and installation of air conditioning. "A factor tending to accelerate this problem is the fact that it requires very little capital and equipment to enter the sheet metal and furnace business," declared Mr. Warning. "I do not believe, however, that this situation will continue in its present prominence when responsible contractors secure sufficient work to re-employ their old mechanics. Most mechanics would prefer to work for a responsible contractor than to suffer the trials and tribulations of a very sketchy independent business."

A very interesting technical presentation of air conditioning

prepared from observations and reading by Mr. Warning was presented as the last part of his address.

Roofing

R. F. Jeske, Milwaukee, recently made a life-time member of the Wisconsin Association, presented an interesting case discussion of roofing problems.

The speaker declared that roofing work might be broken into two general sections—first, the application of "piece" material, that is, tile, slate, shingles; second, the application of sheet materials, that is, copper, tin, zinc, aluminum, etc.

"In the applying of materials included in group one, the pitch of the roof is highly important," declared Mr. Jeske. "If the roof is flat you will have trouble from rain and ice, with group one materials, unless a heavy layer of building paper is first applied and the highest skilled mechanics are used to lay the material." Mr. Jeske cited a number of typical problems wherein rain and ice accumulating because of sun shadows, too flat a pitch, etc., accentuated by roof vibration and wind

pressure resulted in either large leaks or numerous small leaks.

The speaker recommended that with all copper roofs the attic space should be ventilated in order to reduce the effects of expansion and contraction. He declared that the loss of the tin roofing business was due primarily to poor workmanship and that the same situation has been working for a long time in slate and tile application.

Insurance

Recent changes in workmen's compensation, Public Liability and the general insurance field were presented by E. W. Kitzrow, Hardware Mutual Casualty Co. This address covered changes made by the Wisconsin legislature in recent years and the changes which relate directly to the average sheet metal shop. Mr. Kitzrow made the interesting assertion that many of the changes effected in fields such as marble cutting and foundries by changes in insurance regulation will result in increased activity for the sheet metal contractor because such industries will require ventilating systems to meet the new demands of the insurance laws.

Code Discussion

A discussion of the National Recovery Act as it affects the national, state and local associations was presented by Editors Scott, Wilder, Carter of the trade papers as related in the Indiana Association report in this issue.

The ups and downs of the development of codes for gravity and mechanical warm air heating were related by Professor J. D. Hoffman, Purdue University, chairman for many years of the Warm Air Heating Code.

Professor Hoffman explained the progress made in code work, pointing out the many problems which had to be settled before a practical code could be developed and further related the history of the research work of the National Warm Air Heating Association, the history of the establishment of the Research Residence at Urbana, and gave a background to the research tests carried on at Illinois and other universities.

"Shop Management for Profit" was the subject of the address by D. C. Ellison, Northwestern Stove Repair Co., who said that maintenance

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The Roofing and Sheet Metal Contracting Code

(Continued from page 21)

shall enter into a contract which provides for the leaving of any portion of the moneys due under the contract as surety for the guarantee period, or any portion of that period.

Sec. 14. No member of this division shall:

(a) Except for warranties implied in law guarantee or issue a maintenance agreement of any form whatsoever on any roofing and sheet metal work as described in paragraph A. 1. of Section 1 of Article I hereof for a period of more than two years, or assume in any guarantee, maintenance agreement, bond, or otherwise, responsibility for damage to any structure or to the contents of any structure upon which any such work has been done;

(b) Join with any manufacturing concern, individual, corporation, or firm, as principal or surety on any bond, guarantee, maintenance agreement, or otherwise guaranteeing the effectiveness of the work contracted for;

(c) Make any statement, representation or advertisement to purchasers or prospective purchasers that any manufacturer will, independently of the roofing contractor, distributor or other agency, issue any bond, guarantee, maintenance agreement, or otherwise guarantee the effectiveness of their materials for more than two years.

Section 15. Members of this division shall install warm air furnace heating systems in accordance with the Standard Code regulating the installation of Gravity Warm Air Heating Systems issued by the National Warm Air

Heating and Air Conditioning Association except where otherwise required by law.

Section 16. Bidding Practices.

(a) No member of this division shall be a party to the unfair practice of "bid peddling" or "bid shopping" as defined in Chapter I of this Code.

(b) No member of this division shall submit a competitive bid as defined in Section 1 of Article III of Chapter I of this Code, to an owner or any other person corresponding to an awarding authority as herein defined, unless such owner or other person agrees to comply with the regulations provided therein governing an awarding authority.

(c) No member of this division submitting, pursuant to the terms of the bidding, a combination or lump sum bid, shall itemize his bid unless and until he receives the contract for the work included in his bid.

(d) No member of this division shall accept contracts on a "fixed fee" or "cost plus" basis, with an upset price protecting the owner against higher costs but not protecting the contractor against losses.

(e) Regional or local administrative committees created hereunder desiring to install a method of checking competitive bids shall use either the depository or other method provided by the Divisional Code Authority and approved by the Construction Code Authority, pursuant to Article VII, Section 14 of Chapter I hereof.

(f) Each bid filed in accordance with the

preceding paragraph shall be accompanied by a fee of One Dollar (\$1.00). The Divisional Code Authority shall use funds so received to pay the expenses of the regional or local administrative committees in depositing and handling such bids and for other expenses in the administration of this Code. The records of such receipts and expenditures shall be open at all times to the inspection of the Administrator or his representatives.

(g) Upon the request of a bidder, the regional or local administrative committee shall appoint a committee of review, preferably not bidders on that job, which committee shall be empowered to investigate any bid to determine whether any provisions of this Code have been violated in such bid. In the event such committee shall find any such violation, its finding thereon shall be reported to the Divisional Code Authority for such action as it may deem proper in accordance with the Act or this Code.

ARTICLE V MODIFICATION

Section 1. **Amendments.** Subject to the provisions of Section 2 (c) of Article IV, B. of Chapter I hereof the provisions of this Chapter except as to provisions required by the Act may be modified on the basis of experience or changes in circumstances, such modifications to be based upon application to the Administrator and such notice and hearing as he shall specify, and to become effective on his approval. Any such application may be made by the Divisional Code Authority.

The Indiana State Convention

THE fifteenth annual convention of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana was held at the Antlers Hotel, Indianapolis, January 16, 17, 18, 1934. The Indiana convention, according to usual custom, also featured a manufacturers' display and the annual banquet and meeting of the Furmets—organization of traveling salesmen.

Code Problems

Both mornings on each of the last two days were given over to discussions of codes and code procedure. On Wednesday morning code procedure from the standpoint of national and state application were discussed. Edwin A. Scott, Sheet Metal Worker, sent a paper covering the national aspect. Among the several points emphasized Mr. Scott said:

"There are many problems which must be ironed out. These problems cover the application and method of procedure under the code and if the industry is to receive maximum benefit it will be necessary for all interested parties to participate. Means have been provided whereby any individual or firm wishing a hand in electing code authorities or voting on methods can participate by subscribing to the National Association and being present to vote at the national meeting in New York in February.

"So far the returns have been excellent, but it is hoped that all organizations and individuals will signify their willingness to participate. Rightly supervised, our code seems likely to eliminate all the evils of the furnace heating, roofing and sheet metal fields. The new code is a workable, useful method of procedure to consider and remedy all those evils our industry has been complaining of.

"The code for our industry has been declared one of the best codes in the construction field. To stamp out the evils we all know exist there remains only the need for every

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contractor to sign the code and work for its application."

The application and significance of the code from the standpoint of state application and supervision was discussed by J. D. Wilder, AMERICAN ARTISAN. "There has been," declared the speaker, "too much mystery thrown around code procedure. We seem to have forgotten that in reality code work is not new. Most state associations have been working to exactly the same end for many years, and the Indiana association is a typical example. Most of this mystery is entirely unwarranted because there are two basic principals behind all codes. These are to put men back to work at livable incomes and stamp out those evils which have made our line of work unprofitable.

Code Principles

"The code plans to put men back to work by ascertaining how many hours a week are available for our mechanics and to pay these mechanics a livable income. The evils have long been known and all any industry needs is laws with teeth to stamp them out.

"State associations will be important because it is obvious that no central body in Washington can hope to pass intelligently upon controversies far removed. Furthermore, local organizations and com-

mittees may be too close to the controversy to give a fair hearing, hence the seeming need for a state or state-group body. State organizations are already making themselves indispensable by getting statewide movements started, by aiding in the formation of local associations and acting as a clearing house for programs which need state wide support to be effective."

On Thursday morning two additional code discussions were held. The first, covering the work of the national association, was led by Matt Friedman, National Sheet Metal Contractor. "There is too much talk about violations and violators," declared the speaker. "What we should be considering is how can I cooperate to make the code usable and useful. If each signer, or each firm, will determine just how best to cooperate there will be less trouble and greater accomplishments."

Code Status

In connection with this address questions relating to the status of the national code were answered from a letter sent by Secretary Markle. The code has been approved by General Johnson and is awaiting the signature of President Roosevelt, stated the letter. According to the national association the greatest need now is for a good representation from all local, state or other groups and as many individual contractors as can attend.

It was stated that ways and means of financing and applying the provisions of the code will be thrashed out at this meeting.

How the code is affecting local associations was presented by E. C. Carter, Snips, who declared that there are many problems confronting local groups as, for example, unfair competition by public utilities. The oil burner industry has so sewed up installation that the average furnace dealer will not be able to sell and install oil burners. Also stokers and cleaning are being

handled by coal companies to the detriment of our business. Another pressing problem is the pressure applied by minorities without having the consent of the majority of dealers.

"These are typical problems," declared Carter, "and must have attention. Despite these problems the code should be the best thing which has ever happened and should lead to profitable business."

"Business Administration" was the subject of an interesting presentation by two Indianapolis contractors. A chart of operating figures taken from the actual operation of a local shop was used to illustrate just how an annual volume of business can be broken down to show where all moneys went and what profit was left. The moral of the lesson was a need for a day-by-day set of accurate accounts and a set of books to show the cost of raw material, productive and non-productive labor, overhead, etc.

Arthur Frazee

Arthur F. Frazee, Rudy Furnace Company, spoke on "Changed Aspects in the Warm Air Heating Industry" and delivered an invitation from the National Warm Air Heating Association to all contractors to attend the June meeting of the association in Chicago, especially for "Dealer's Day." "Warm air heating has been a most important contribution to the comfort, convenience and pleasure of the American public," said the speaker.

"The National Warm Air Association has done much to establish and improve warm air heating by supplying the money and talent necessary to conduct exhaustive research at Urbana, to give publicity to these findings and to promote warm air heating in general.

"Evils have crept in, mostly because of conditions set up by the depression. We have seen easy credit, alley dealers, long terms, future datings, jerry building, poor installation, bad economies in installation, over production and cut-throat competition between manufacturers and between dealers. The only reason these evils did not cause

serious trouble was that the market for furnaces grew year after year as the general building business reached the four billion dollar classification.

"This market was so vast that the evils did not come to the surface until the depression came along and new construction fell to zero. The same evils that were not apparent before became magnified under depression conditions and also aggravated as more manufacturers and more contractors fought for every sale.

"Now we have our codes—one for the manufacturers and another for the contractors. Both codes are specifically designed to stamp out these evils. The codes will do this if they have our entire support. We hope that these codes will eradicate the evils of mail order and direct-to-you competition. Manufacturers must now sell above cost. The contractor must install adequately; his bids must be above costs and according to regulation. A new day for the industry is dawning."

I. W. Rowell

"A Survey of Air Conditioning Possibilities," was the subject of an address by I. W. Rowell, Lakeside Company. "There are in the country 29 million families using 25 million dwellings of which 22 million are one family and 2 million two family and each of these is a logical outlet for air conditioning equipment," declared Mr. Rowell.

"The industry can figure that every one of these 24 million dwellings can use an installation costing from \$1,000 to \$5,000. Certainly there are millions of prospects for partial equipment such as blowers, filters, controls, etc., costing from \$150 upwards installed. If we set \$500 as an average sale price and multiply this by 2½ million prospects we have a potentially one billion market.

"The job today is to get this business. That it can be done is proved by dozens of contractors in every state of the union. The way these men get business is to work a little longer and a little harder than the rest of us. Air conditioning is on

everyone's tongue. We read about it, hear about it on all sides. Sometimes it seems as though this vast amount of publicity is leading us to sit idly by waiting for business.

"We must all learn all there is to know about air conditioning. We must learn to choose intelligently among the hundreds of gadgets for which all manner of things are claimed. We must learn how to engineer, install, sell, teach, but we must first understand and then learn to explain. I say that every owner of a dwelling is a prospect for air conditioning. Perhaps he needs complete conditioning; perhaps partial conditioning. Regardless, he is a prospect for some variety."

Frank Meyers

Frank Meyers, Owens-Illinois, presented the first information on his company's test house in which will be established full data on filter cleaning and house insulation.

Speaking on "Finished Raw Materials," A. C. Hasse, American Nickeloid Company, stated that there are three ways of getting business—new customers, old customers, greater volume from active customers. Mr. Hasse spoke briefly on the characteristics of his company's material and then threw the address open for discussion. In the questions and answers numerous shop kinks were brought out, particularly methods for preventing fracture or scarring of the metal surface in forming.

"Anybody's Business" was the subject of a talk by C. M. Riefkin, Newport Rolling Mill Company. The speaker made a plea for closer relationships between manufacturer, contractor and trade press in order that potential business might be secured, the general quality of work raised and sheet metal might come into its own as a construction material. Many changes in materials and methods have come into being lately and every such change should be taken advantage of. Contractors can't be told exactly how to sell—what to say—but cooperation and a willingness to work can develop ways and means of getting the utmost from present knowledge.

AMERICAN ARTISAN

Air Conditioning Section

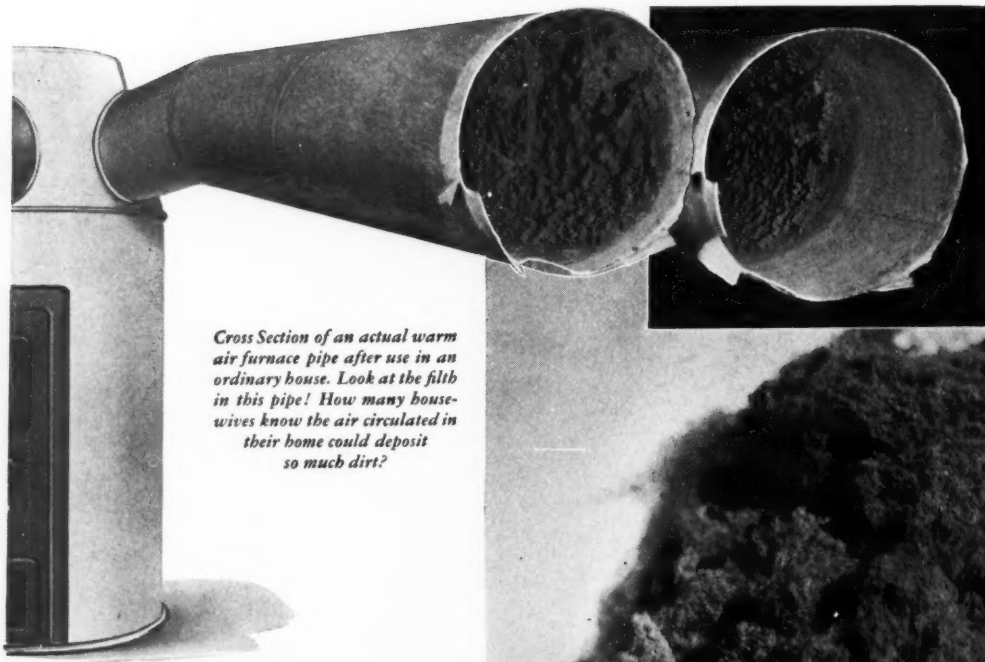
Devoted to the technical and merchandising problems
of air conditioning in homes and small buildings

TEST data are of two kinds—laboratory tests in which certain facts are sought and tests of actual installations to see how the systems operate. Most contractors learn from the first, but neglect the second which is more important.

- - - - In the December, 1933, issue the troubles of one system were related. The new system has been under test and we report here some preliminary findings.

- - - - We believe that comfort is a very loosely used term. What is comfort? It is the thing we are really selling, but how do we get it? Professor Kratz begins in this issue an outline of the factors which make for comfort. There's real ammunition in his articles.

- - - - Have you followed the articles on automatic control? If so, you will be interested in this month's article which summarizes the good and bad points of the three hookups discussed to date.



Cross Section of an actual warm air furnace pipe after use in an ordinary house. Look at the filth in this pipe! How many housewives know the air circulated in their home could deposit so much dirt?

The same pipe after deposited dirt had been scraped from linear foot length of pipe. Actual amount of dirt removed is shown below. Awful? Yes, but it means money to you!

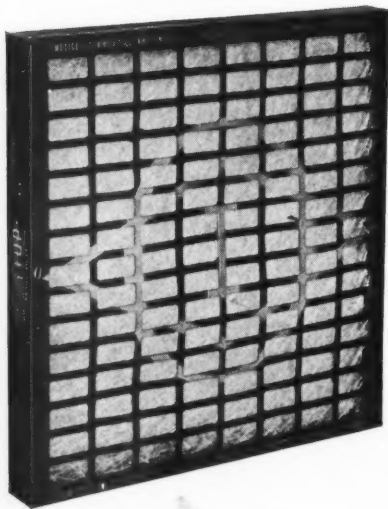


A source of DRUDGERY to
housewives... a menace
to HEALTH

BUT it's

"PAY DIRT"

to furnace dealers



*Standard, Commercial Dustop
Glass Wool Air Filter Unit.*

● Dustop has opened up a great new market for furnace dealers in eight million homes with sales ammunition like this! Forceful evidence of this kind can be found in the leader pipes of millions of homes equipped with ordinary warm air heating systems. When this amount of dirt has been deposited within the pipes, the housewife can readily imagine how much is circulated throughout the house.

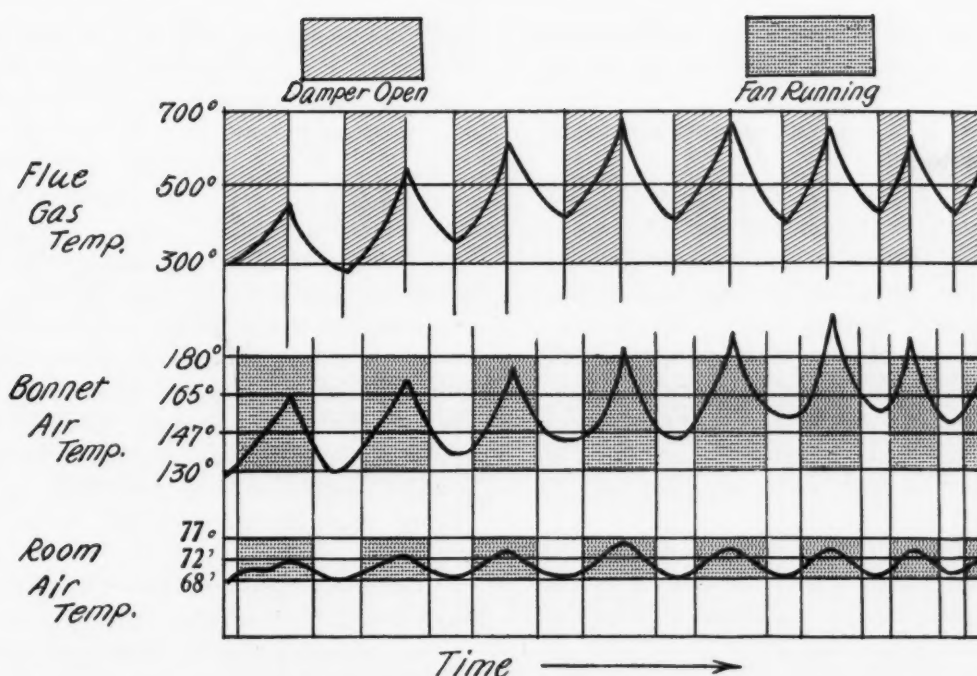
"Stop circulating this dust and dirt!"—What a whale of a sales story to tell your customers! The Dustop equipped warm air furnace, either

gravity or forced fan type, now gives *cleanest heat*, and the cost is extremely low. There is no cleaning to be done—dirty filters are thrown away and replaced at small cost with new ones.

Investigate Dustop today. Start digging for your share of the PAY DIRT in the warm air furnace market. Write for information. Owens-Illinois Glass Company, Industrial Materials Division, Toledo, Ohio. Dustop is sold by all leading fan and blower manufacturers. (Dustop is assembled and installed in Canada by General Steel Wares, Ltd., Toronto.)

OWENS-ILLINOIS

DUSTOP AIR FILTERS



On this chart are shown the flue gas temperature, bonnet air temperature and room air temperature of a control system using a room thermostat and damper motor without limit control (Hookup 1). Note the over-run of room temperature, bonnet temperature and the excessive flue gas temperature indicating waste of fuel. On the temperature lines we have blocked in the portions of time when the fan runs or the damper is open.

Automatic Controls

This article reviews the three control hookups discussed to date in this series. In order to show the good and bad points of the three systems an operating chart is given for each hookup. A study of the charts will show how the temperatures range, how long and when the fan runs, how often the draft opens, etc.

IN the series of articles on automatic controls published since last June, three common types of control systems have been discussed.

The first system consisted of a room thermostat controlling the fire through a damper motor which operated the draft and check doors plus a bonnet control to start and stop the fan at predetermined bonnet air temperatures.

The second control system went one step further and added a second bonnet control—a limit control—whose function was to check the fire before a runaway fire condition resulted during any prolonged period of fire acceleration.

The third control system used the same apparatus as system number two, but the fan and limit controls were wired in series with the room thermostat so that when the room thermostat was satisfied, the whole system shut down, regardless of air temperatures in the bonnet.

Future articles in this series will discuss systems wherein the room thermostat controls the fan, while a bonnet instrument controls the fire

keeping "heat on the shelf." Other articles will discuss zone control systems and systems for oil burner, gas furnace or burner and stoker fired systems. In addition, articles will be published on special hookups which contractors and engineers have found advantageous for special conditions.

This article is a resume of the three systems discussed to date. The general characteristics of these three systems are shown in the operating diagrams and it is suggested that these three diagrams be given close attention, inasmuch as each diagram gives in complete detail the characteristics of the fire, bonnet air temperature variation, fan and damper operation during typical operating cycles.

The diagrams present graphically the cycles of operation of the fire and fan and give the accompanying fire and air temperatures during the same operating cycles.

For review purposes we present once more the functions which any good automatic control system should insure. A control system should:

1—Maintain **uniform room temperatures** throughout the house during all outside weather conditions.

2—Be **dependable** in operation, **simple** in installation and **easy** to set.

3—Maintain a uniform combustion rate **just sufficient** to meet the demands of the house.

4—Be able to **handle sudden or prolonged heat demands** without special adjustment and without permitting runaway fire conditions.

5—Require a **minimum of adjustment** by the home owner and contractor.

6—Provide **safety features** in case of electrical or mechanical trouble and in case the owner leaves draft doors open or draft doors are held open by ashes or coal.

These six desirable characteristics of a control system are well worth study. A control system which meets some of the six characteristics, but sacrifices other functions, ought not be called a satisfactory system. In other words, a system which maintains uniform room temperatures, but wastes heat by reason of shutting off air circulation while the fire burns brightly will be uneconomical and hence unsatisfactory. Further, a system which uses a small amount of fuel, but is sluggish in responding to the heat demands of the house, is likewise unsatisfactory.

How do the three systems discussed to date meet these six desirable characteristics?

As shown on the diagram, control system number one showed the following characteristics: Due to the fact that the fan was controlled by the bonnet instrument, which in turn was actuated by the air temperatures in the bonnet, the chief fault of system number one proved to be over-ride of room temperature. The reason for this fault lies in the

fact that so long as the room thermostat remains unsatisfied the draft remains open. During warming up periods the draft may therefore be open for a long period of time with the fire accelerating continuously. When the room thermostat is finally satisfied, the fire has reached its maximum combustion condition.

The fan, because it operates on bonnet air temperatures, continues to force air into the house, resulting in over-run of room temperatures. A second fault is that because of this typical characteristic more fuel is consumed than necessary. A third fault is the need to synchronize the fan control settings with outside weather—lower in mild weather, higher in cold weather—and, since this change must be made by the owner, results are uncertain.

Generally speaking, control system number one has more faults than advantages.

In control system number two the limit control was used to check the fire before the room thermostat was satisfied, so that when house temperatures were up to setting, the fire would have been checked by the limit control and the fire would be dying down by the time room thermostat was satisfied.

The good points of this system are:

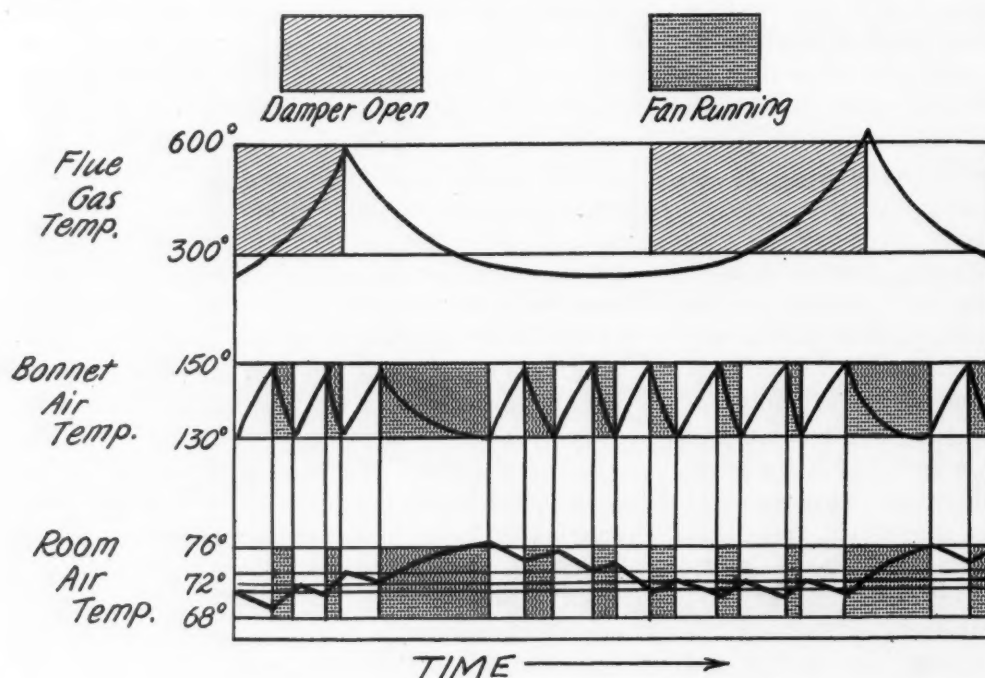
(a) When the limit control is properly set, runaway fire condition is prevented in most cases.

(b) Due to this check on the fire, room temperature over-run is greatly reduced or eliminated.

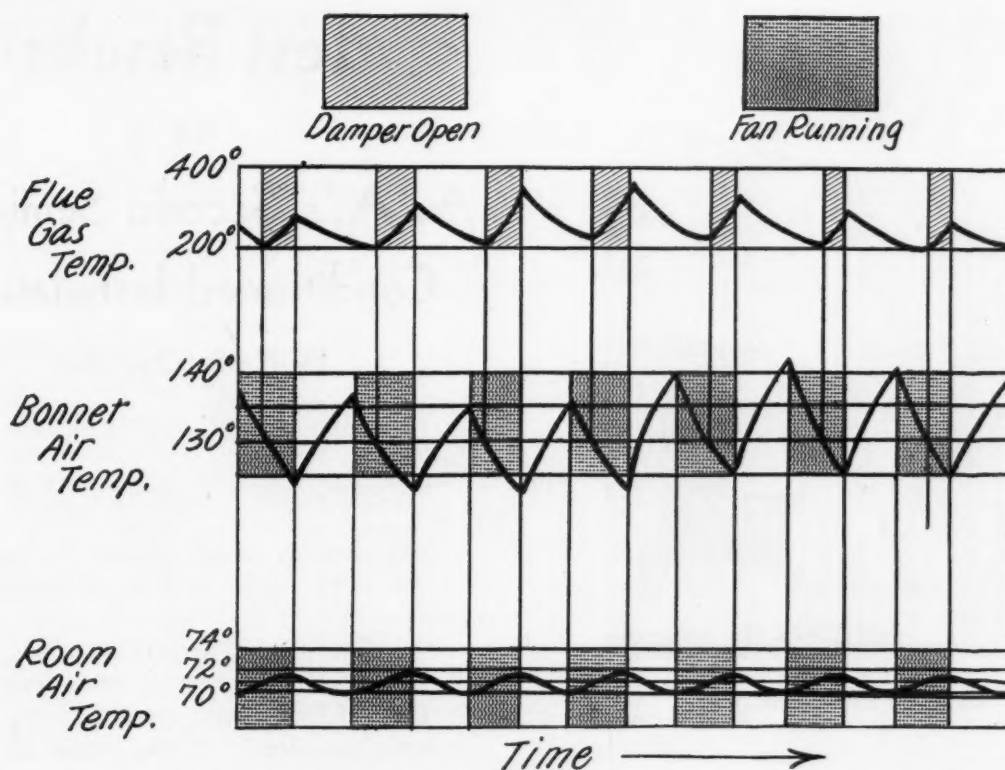
(c) Fuel consumption is reduced and is kept under close control.

(d) Combustion rate is kept fairly uniform and in fairly close coordination with heating demands.

(e) The system is simple to install, wire and adjust.



This operating chart for our second hookup (using a limit control) shows that bonnet air was well controlled between low temperature limits while the flue gas temperature seldom exceeded 600 degrees which is not excessive. Room temperatures over-ran somewhat because the fan runs until the bonnet air temperature drops to the low setting. As shown this over-run amounted to a maximum of 8 degrees for average weather. Note the lag between fire response (as indicated by flue gas curve) and the room temperature.



This chart for hookup number 3 shows close control over bonnet temperatures, also low flue gas temperature and close control over room temperatures. In this hookup the fan runs only when the room thermostat calls for heat. Close co-ordination between instruments prevents over-heating of the furnace.

The chief disadvantages of the system are:

(a) There is no safety control provided for emergencies.

(b) Low settings of the fan control and limit control must be used for satisfactory operation and this requires adjustment of both instruments according to outside weather. Both must be raised in cold weather and lowered in mild weather.

(c) Each individual installation requires considerable experimentation to determine the best settings and differentials for both fan and limit control.

(d) The home owner must be depended upon to change settings.

In the third control system the chief aim was to maintain room temperatures within a range of not more than two or three degrees. While system number two showed good results in room temperature variations, there undoubtedly would arise conditions where room temperature over-run would occur. A typical case would be with use of highly combustible fuels which would accelerate rapidly during warming up periods, despite the fact that the limit control shut off the draft. Another instance might be in mild weather when the owner did not lower fan and limit settings.

To overcome this problem the fan and limit control in system number three were wired in series with the room thermostat. The result is that when the room thermostat is satisfied, the fire is always

checked and the fan cannot run, regardless of how high the bonnet temperature may be.

Obviously this system favors the room thermostat, but inasmuch as the room thermostat is the instrument by which the owner gauges the results of his system, this is not a particular fault. Also, it is obvious that, since the room thermostat is favored, the installer must be absolutely sure that his settings for fan and limit control will cooperate with the thermostat in order that overheating of the basement and waste of fuel shall not occur.

The advantages of system number three are:

(a) Very good uniformity in room temperatures.

(b) Uniform and positive control over combustion.

(c) Ease of installation, setting and changing. The disadvantages are:

(a) Experimentation required to determine the correct settings and differentials required for any given house.

(b) Some change required by owner or contractor to conform with extreme changes in weather.

Since these three control systems are undoubtedly the commonest hookups used today, it is suggested that contractors study the conclusions presented. Note that no effort has been made to show any one of the three systems as the ultimate in control operation, since there cannot be at the present any such "ultimate" system.



Exterior of house under test.

IN the December, 1933, issue we presented preliminary tests on one of the AMERICAN ARTISAN test houses including full discussion of the design and characteristics of the old, unsatisfactory system and detailed information on the design of the new plant.

In this December article we stated that additional test data for the system would be presented with operating cycles and as much data as possible on the operating characteristics of the system under average day-to-day conditions.

This article presents the data secured on a typical operating run. It is suggested that readers refer back to the December article for data on the previous system's troubles as space does not permit covering these facts again.

In the following test data, the term "approximately" will be frequently used. While definite figures will be given in some cases, it should be understood that these tests are made in houses that are being lived in and doors are opened frequently hence some items on the data sheet are arrived at by supposition, or calculated from data by standard authorities. However, such standard authority data tests are conducted by experienced men who have nothing to gain by subterfuge regarding any system or apparatus. They are frankly investigators who are more likely to disapprove than to allow any calculation the credit of a doubt.

While calibrated instruments are used on these test systems the conditions under which the plants are tested and operated do not tend to give precise data. In other words, they are *field* tests, but the calculations shown on the data sheets should not vary more than 5%.

Test Results on A. A.'s Second Semi-Air Conditioned Installation

By Platte Overton

The date of the test reported here was January 30, 1934.

Duration of test: 14 hours (6:10 a. m. to 8:10 p. m.)

Mean outside temperature for 14 hours: $+7^{\circ}\text{F}$.

Prevailing winds: from south west; velocity 5 miles per hr.

Sunshine: 8:15 a. m. to 2:30 p. m.

Cloudy and over cast: 2:30 to 8:10 p. m.

Type of fuel used: petroleum coke.

B.t.u. per pound: 15,296. (Fuel office report.)

Fuel burned: 183 pounds.

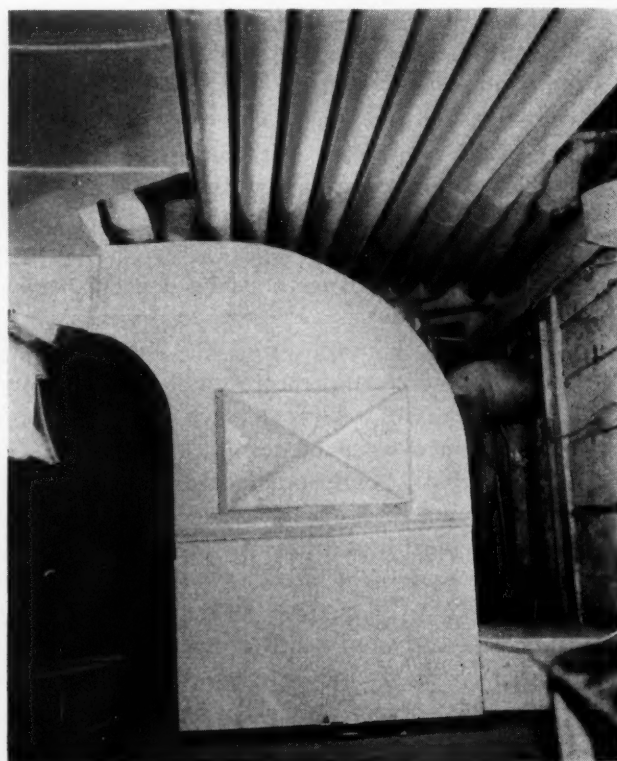
Fuel burned per hour: 13.07 pounds.

Combustion rate per sq. ft. of grate per hour: 2.71+.

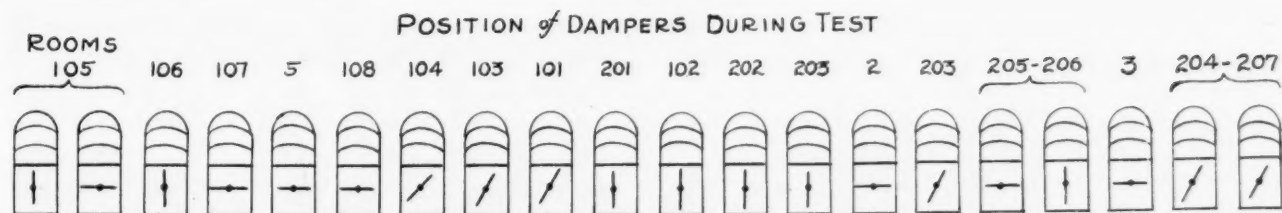
Temperature average of 13 rooms: 74°F .

Temperature flue gas at furnace (average): 470°F .

Bonnet stat: set at 185 degrees.



Rear view of installation showing 6-inch leaders to front of house, return air duct and fan housing, short smoke pipe and return from basement flat.



Dampers are in position as set by the owner. They were not moved for the test.

Average temperature of rooms:

First Floor

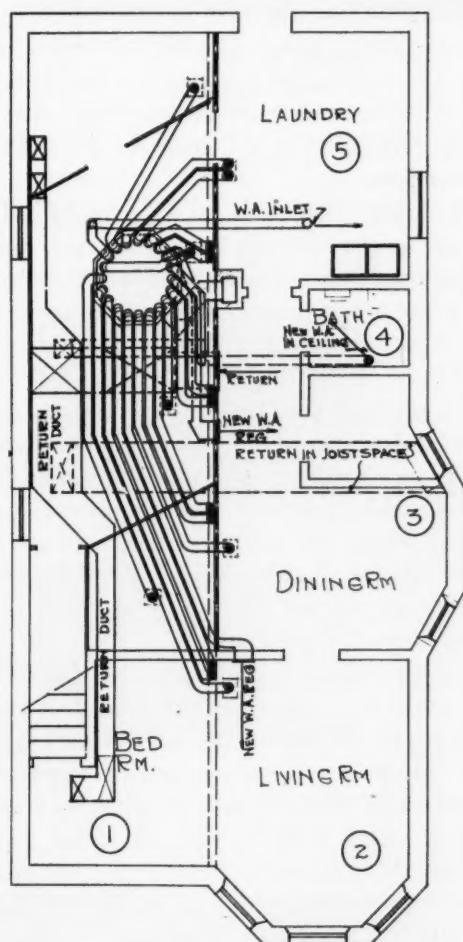
Room 101—Hall	70 degrees
Room 102—Living	70 degrees
Room 103—Dining	71 degrees
Room 104—Bath	74 degrees
Room 105—Kitchen	72 degrees
Room 106—Bed Room	76 degrees
Room 107—Bed Room	78 degrees
Room 108—Bed Room	68 degrees

Second Floor

Room 201—Den	71 degrees
Room 202—Living	73 degrees
Room 203—Dining	76 degrees
Room 204—Bath	80 degrees
Room 205—Kitchen	80 degrees
Room 206—Bed Room	76 degrees
Room 207—Bed Room	78 degrees

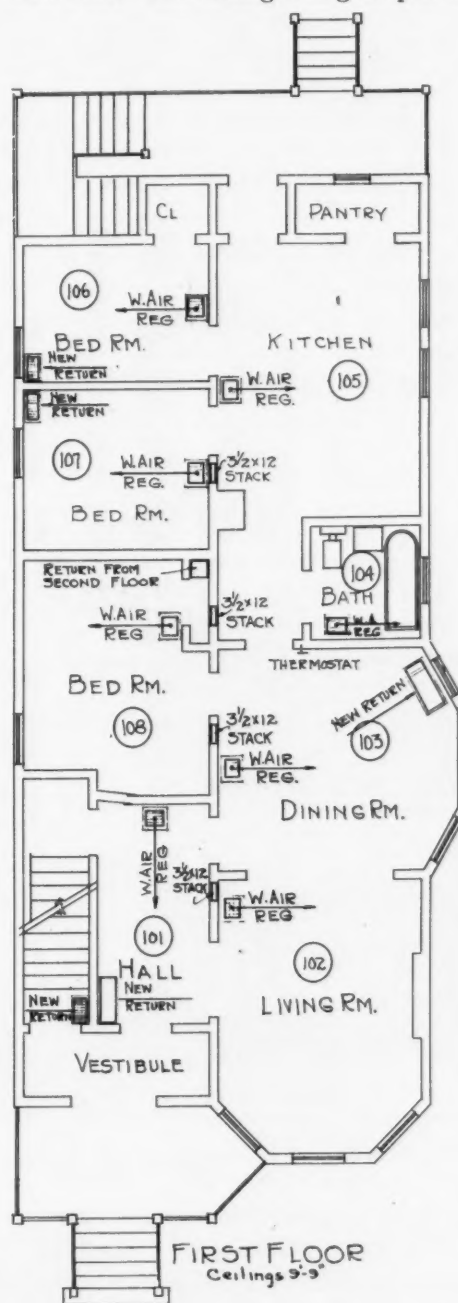
Operation of blower—the following is typical of the average cycle of fan operation:

Temperature drops—thermostat opens drafts.
Thermometer in duct 12 inches from furnace hood shows 196° and falling 1 degree per minute.



BASEMENT FLOOR PLAN
Ceilings 7'-0"

This is the new system showing the basement apartment and the runs of 6-inch leaders. The return system is entirely new. The basement apartment was originally heated by a stove.



The system is guaranteed to heat the first floor to 75 degrees at zero. Of all the rooms, only numbers 105, 106 and 107 were ever warm enough. All the old floor registers are being used, but new returns are used, since there were no returns previously.

DATA SHEET
Based on +1 Cold Weather & Prevailing Winds From South West
American Artisan Test House Jan 30-34
Chicago
Arch. Exp. Platte Overton.

Room No.	1-2	3	4	5	101	102	103	104	105	106	107	108	201	202	203	204	205	206	207	TOTALS
Use	Living	Dining	Bath	Laundry	Hall	Living	Dining	Bath	Kitchen	Bed Rm	Bed Rm	Bed Rm	Den	Living	Dining	Bath	Kitchen	Bed Rm	Bed Rm	
MEASUREMENTS																				
1. Room Dimensions	12' x 18'	9' x 15'	4' x 6'	11' x 15'	6' x 12'	12' x 14'	12' x 14'	6' x 6'	12' x 15'	11' x 7'	11' x 9'	11' x 12'	8' x 11'	12' x 14'	12' x 14'	6' x 6'	12' x 15'	11' x 13'	11' x 11'	
2. Ceiling Feet Area	216	135	24	165	72	168	168	36	180	77	99	132	88	168	168	36	180	143	121	
3. Floor Area	1512	810	240	1584	792	1512	1512	360	1890	539	891	1296	968	1512	1512	360	1890	1431	1111	
4. Room Volume	2520	1215	120	2652	1260	2520	2520	216	3240	861	1485	2016	1584	2520	2520	648	3240	2403	1933	
5. Ceiling Height	12	13.5	3	17.6	21	15.6	15.6	3	21	12.3	16.5	16.8	18	15.6	15.6	18	18	17	17	
6. Wall Area	1008	540	108	1008	420	1008	1008	108	1512	441	726	1008	792	1008	1008	108	1512	1260	1008	
7. Window Area	144	144	0	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	
8. Door Area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9. Wall Losses	1008	540	108	1008	420	1008	1008	108	1512	441	726	1008	792	1008	1008	108	1512	1260	1008	
10. Window Losses	144	144	0	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	
11. Door Losses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12. Infiltration Losses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13. Total Heat Loss	1152	684	108	1152	564	1152	1152	108	1656	585	870	1152	792	1152	1152	108	1656	1404	1148	
14. Room Temperature	60	64	66	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	
15. Outside Temperature	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
16. Wind Velocity	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
17. Wind Direction	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	
18. Wind Losses	1008	540	108	1008	420	1008	1008	108	1512	441	726	1008	792	1008	1008	108	1512	1260	1008	
19. Total Heat Loss	2160	1224	216	2160	984	2160	2160	216	3168	1026	1596	2160	1584	2160	2160	216	3168	2664	2156	
20. Heat Loss per Hour	360	204	36	360	164	360	360	36	528	171	266	360	264	360	360	36	528	444	359	
21. Heat Loss per Room	360	204	36	360	164	360	360	36	528	171	266	360	264	360	360	36	528	444	359	
22. Heat Loss per Square Foot	2.4	2.4	1.5	2.4	2.4	2.4	2.4	1.5	2.8	2.4	2.7	2.8	2.7	2.4	2.4	2.8	2.4	3.1	3.2	
23. Heat Loss per Cubic Foot	0.0016	0.0016	0.0005	0.0016	0.0016	0.0016	0.0016	0.0005	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0023	0.0023	
24. Heat Loss per Hour per Room	360	204	36	360	164	360	360	36	528	171	266	360	264	360	360	36	528	444	359	
25. Heat Loss per Hour per Square Foot	2.4	2.4	1.5	2.4	2.4	2.4	2.4	1.5	2.8	2.4	2.7	2.8	2.7	2.4	2.4	2.8	2.4	3.1	3.2	
26. Heat Loss per Hour per Cubic Foot	0.0016	0.0016	0.0005	0.0016	0.0016	0.0016	0.0016	0.0005	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0023	0.0023	
27. Average	117,627																			
28. Service																				
29. Air Supply																				
30. Air Flow																				
31. Air Pressure																				
32. Air Velocity																				
33. Air Density																				
34. Air Weight																				
35. Air Volume																				
36. Air Mass																				
37. Air Energy																				
38. Air Entropy																				
39. Air Heat																				
40. Air Work																				

Filled in test data sheet showing results obtained.

At 7:01 p. m. draft door opens.

At 7:05 p. m. thermometer shows 200°.

At 7:07 p. m. thermometer shows 208° and blower starts. Runs for 45 seconds—off 64 seconds as the thermometer shows drop to 168° and starts fan at 208°.

The "off" periods decrease in time and the

"on" periods increase in time for about 8 or 10 periods and fan then operates continuously for 14 minutes.

Draft door closes and in four minutes fan returns to intermittent cycles with the "on" period decreasing in time and the "off" periods increasing.

Control—For the first 7 hours of the test the fan was operated through the bonnet stat with the room thermostat operating the draft and check. For the last 7 hours the draft damper was operated through the room thermostat and a stack limit control.

The controls on this test plant are the basis of another article and nothing further will be said about them at this time.

The Heat Requirements—The data sheet indicates the conditions found at the house the day of the test. Six of the rooms were cut off at the furnace and register. No attempt was made to change any condition of the system. The test was made after the owner had set the volume dampers, and declared the system satisfactory.

The pantry and vestibule on room 105 had been removed and a glassed in porch was in course of construction, but the sash were not in. This left two sides of the room exposed with two outside doors. The infiltration was high. The average velocity of the incoming air at the cracks was measured and the calculations made on the B.t.u. loss per linear foot.

This data sheet tells its own story. To the total average of 117,627 B.t.u. loss per hour for the building we must add the loss for rooms 4-5-107-108 as these areas were brought up to temperature by indirect heat from the pipes, casings, smoke pipe, etc.

It is obvious that the front section of the second floor must be brought up to the guaranteed temperature of 80° This may be accomplished by one of several methods. The thermostat may be moved to room 201 and the balance of the house volumed to the heat requirements. This method will decrease the air supply volume and increase the inlet temperature.

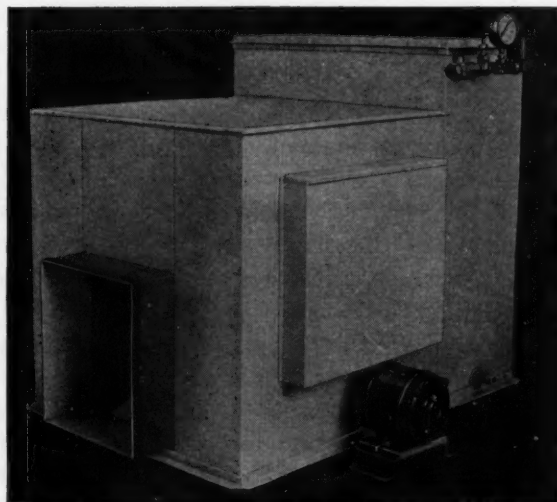
Another method is to step up the fan in speed, increase the c.f.m. supply in this room, set the bonnet stat to increase the inlet temperature and volume the balance of the rooms to heat requirements. The thermostat in this case to remain as shown on the plans. Both methods will be tested.

It will be observed that room 102 is heated not only from the entering air at the register, but from rooms 101-103 as the air supply and inlet temperature (room 102) do not indicate that this one inlet alone would fulfill the heat demand. This is also true of rooms 201-202.

No infiltration loss is given for rooms 107-108-

(Continued on page 43)

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The Filter Is Always Clean

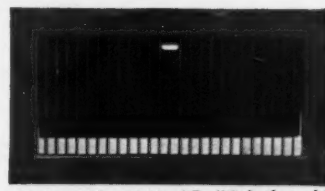
The water spray is directed upon the filter keeping it saturated, and a very large scrubbing surface is provided for the air. Any particles of dirt not removed from the air will be stopped by the filter. This dirt is washed off the filter by the spray water, which keeps the filter clean, thereby guaranteeing perfect air cleaning and free and unobstructed passage of air.

INDEPENDENT "FABRIKATED"

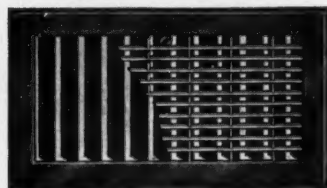


Design No. 311 SE "Fabrikated."
Showing the Straight Edge.

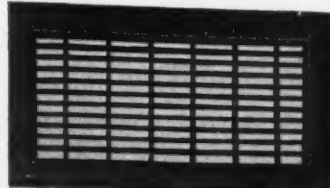
FORCED AIR
REGISTERS
and GRILLES
LEAD the
WAY.



Design No. 211 BE "Fabrikated."
Showing the Beveled Edge.



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What Is This Thing Called "Comfort"

By A. P. Kratz

Research Professor

Department of Mechanical Engineering
University of Illinois

THE earliest theories of heating and ventilation, in common with those of physics and medicine, were largely based on misconceptions, and were concerned with giving names to various phenomena rather than with seeking the underlying causes based on facts obtainable from observation. The most generally accepted of these older theories was based on the idea that carbon dioxide was toxic, and that sufficient outdoor air must be supplied to keep the concentration, produced by the carbon dioxide exhaled in the breath, from rising above approximately 7 parts per 10,000 cubic feet of air. Although carbon dioxide was later proved to be not inherently toxic, this theory afforded

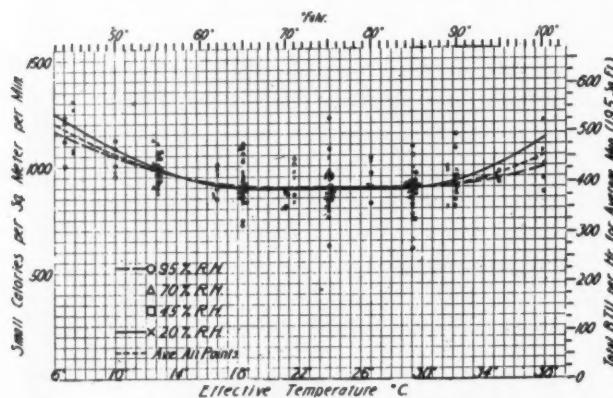


Fig. 1—Relation between heat production in the human body and Effective Temperature.

a definite means of computing air quantities, and the standards of ventilation requirements now in common use are largely based on the carbon dioxide theory. However, while this theory provided a workable basis for establishing ventilation standards, it furnished no means of explaining what constitutes comfort, or of establishing standards of comfort.

More recent investigations undertaken at the American Society of Heating and Ventilating Engineers Research Laboratory have resulted in a theory that explains comfort and points the way toward establishing standards of both comfort and ventilation. This theory is based on regarding the human body as a heat engine, and accepting the fact that all bodily processes and functions ultimately result in heat production. The amount of this heat production for the case of a sedentary individual in still air is shown in Fig. 1, and it may be observed that the heat generated remains practically constant at 400 B.t.u. per hr. over a range of effective temperatures extending from 62 to 87 deg. F. The full import of the term "effective temperature" will be explained later. At this point it may be re-

garded as a composite temperature, or as an index representing the combined thermal effect of a number of factors in the environment.

Under all circumstances, the heat generated by the body must be removed at the same rate at which it is generated, or else the normal functions of the body will be interfered with and some degree of discomfort will result. In cases of wide deviation between these two rates, serious derangements resulting in permanent injury or death may occur. The rate of heat loss is of course determined by a number of factors involved in the environment. If this environment is unfavorable, the body attempts to compensate for it by making adjustments tending to accelerate or to retard the loss of heat. The most obvious of these adjustments are perspiration, shivering, and increases or decreases in skin temperature. As long as the individual is unconscious of such bodily adjustments, a state of comfort may be regarded to exist, and discomfort begins as soon as any of the mechanism of adjustment becomes consciously apparent.

Figure 2 shows the measured rate of heat loss from a sedentary individual in still air. It may be noted that this rate is 400 B.t.u. per hr. over a range of effective temperatures extending from 62 to 87 deg. F., and that both the rate and the range are identical with those shown in Fig. 1 for the heat generated. Hence, it is apparent that the range of comfort must lie somewhere within this range of effective tempera-

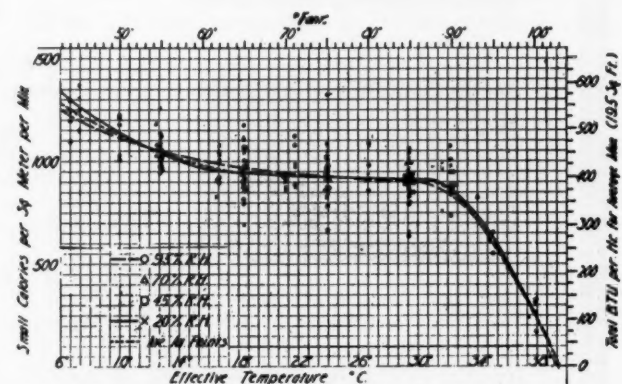
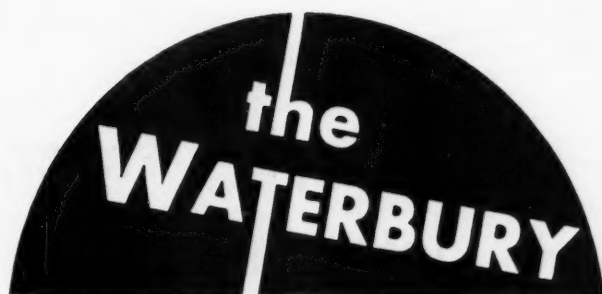


Fig. 2—Relation between heat loss from the human body and Effective Temperature.

tures. The whole range does not necessarily represent comfort, however, because the heat loss in some parts, particularly at the two extremes, is undoubtedly at-

(Continued on page 41)



line for 1934

*brings Substantial Profits
Steadily Builds Business*

A GAIN WATERBURY steps out in front—with a line of furnaces and air-conditioning equipment that takes the lead for efficient, dependable performance, with proved features far in advance of anything else offered.

Waterbury COMFORTROL, a complete air-condi-



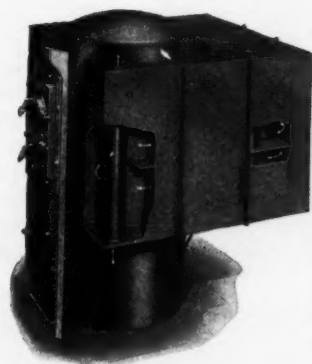
tioning system fulfills the ideal of years for CONTROLLED COMFORT and all-season enjoyment. Its various functions are

easily and positively regulated by new Waterbury control devices that insure the owner's utmost satisfaction.

Permanently CLEAN warm air heat is one of the basic features of the COMFORTROL. The heating unit is built of heavy seamless welded steel. No joints, no rivets, no cement. Leaks are impossible. All types of Waterbury furnaces—coal, oil and gas—have this important feature for permanently CLEAN Heat.



New Warm Air Oil-Burning Furnace

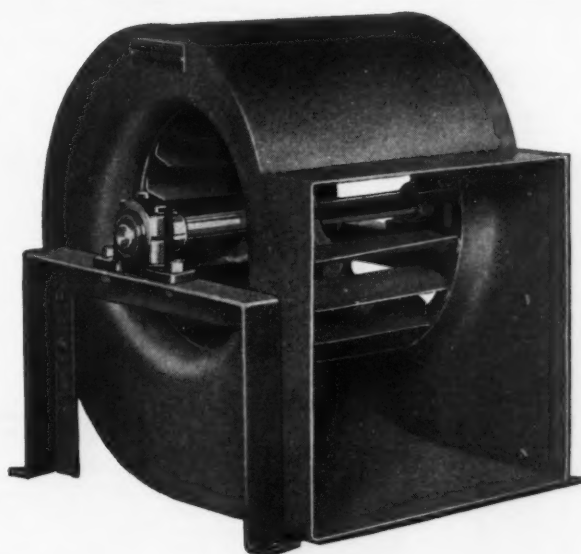


Waterbury has pioneered in the building of a REAL Oil-burning Warm Air Furnace. Its remarkable economy is due to entirely new features of design with a large combustion space, long fire travel and tremendous heating surface. Low stack temperatures. No excess heat wasted up the chimney. Answers the universal demand for oil-burning economy. Used with any oil burner.

A Big Year Ahead for Waterbury Dealers

This new equipment and our engineering and merchandising assistance means greater profits and a steadily increasing business for Waterbury dealers. Don't fail to get all the facts. Write us today for new catalog and complete information.

WATERMAN - WATERBURY CO.
1122 JACKSON ST. N. E. MINNEAPOLIS, MINN.



Furnace Fans

*Silent, Efficient
Standardized Multiblade
Units for Furnaces
and Forced Air Heating,
Cooling and Drying Systems*

More than fifty years' experience in designing fans is behind the Buffalo Furnace Fan. This full-housed centrifugal fan assures a positive delivery of a large volume of air—so necessary because of the back pressure encountered in the usual hot air furnace or duct system.

Silent in operation

Vitally important in fans used for domestic installation is quiet operation. Buffalo Furnace Fans are QUIET at speeds for which they are designed.

Single, double and triple units

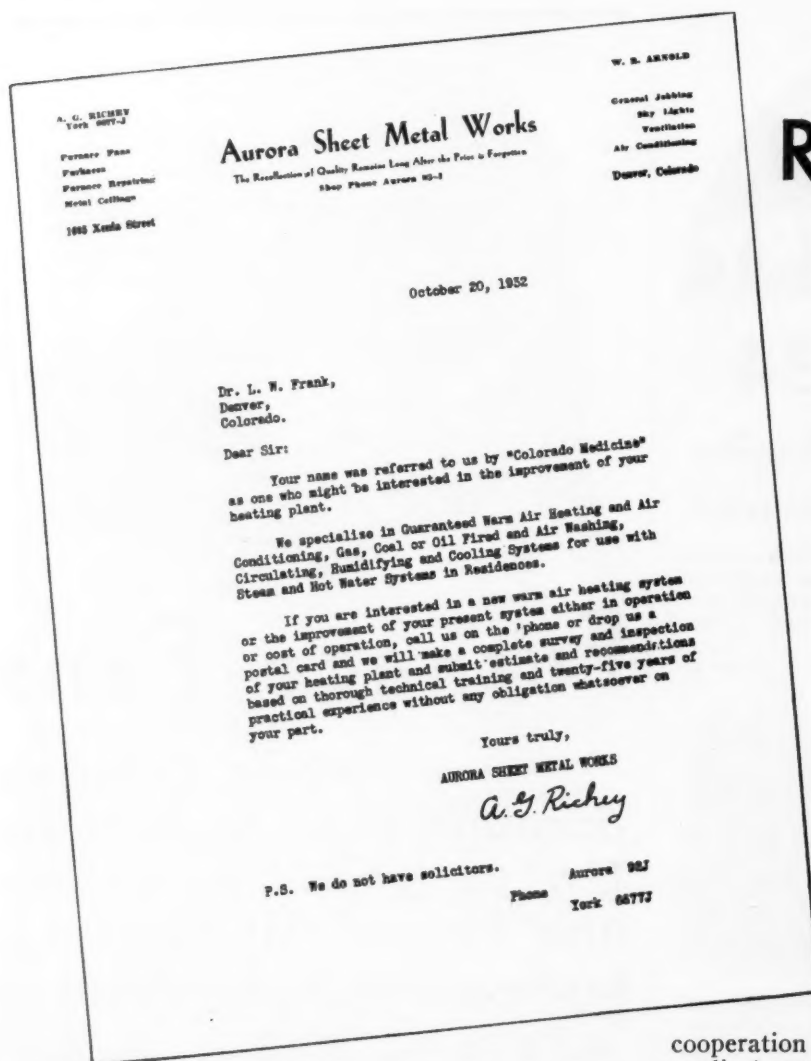
Furnace Fans are available for stock shipment in single, double and triple units,—that is, one, two or three fans on same shaft.

Dimensions and specifications

Complete data covering dimensions, specifications and capacities on all sizes will be sent those interested. Write today for Bulletin 2907.

Buffalo Forge Company
497 Broadway, Buffalo, N. Y.

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



Richey, in Denver, Introduced Air Conditioning Through the Doctors

By
Lucius S. Flint

The letter shown above was mailed to 100 physicians selected for their interest in air conditioning. The article explains the response obtained.

HOW to sell air conditioning? That is a real question and here are a number of practical pointers on the subject from the man who pioneered this work in Denver, and who is said to have installed nearly 90 per cent of the complete air conditioning jobs put in there to date. He is Amos G. Richey, president of the Aurora Sheet Metal Works, located in Aurora, a suburb of Denver.

Long before the average Denverite had any idea of the meaning of the term air conditioning, Richey realized that the line was a coming one, and set out to develop it. When he installed his first air conditioning job, not a single domestic washer or blower had yet made its appearance on the market. Richey made his own. Most of Richey's jobs have been of the domestic type, installed in houses ranging in value from \$7,000 to \$25,000.

Advertises to Doctors

In the belief that medical men, more than any other single class of people, would understand fully the benefits of air conditioning, Richey recently used a novel advertising campaign appealing to them. The drive was designed not only to get the personal business of the doctors, but also to get their support for the industry, it being realized that medical men carry a great deal of "weight" with the average layman.

The advertising campaign was carried on in

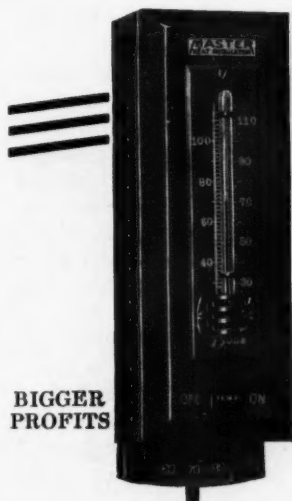
cooperation with the official journal of a Colorado medical association. Richey agreed to take a monthly ad in the paper if the advertising department would get him the names of all the doctors in Denver who might be interested in air conditioning.

This was accomplished by a questionnaire sent out by the publication to 565 doctors. Out of this number, 500 replies were received. This entire list was turned over to Richey. He went through and picked out the names of all those men whose answers indicated that they might be in the market—about 100 in number. To all of these people were sent individually typed and personally signed letters such as the one shown here. The letters were given a note of authority through use of the publication's name.

Richey's Questionnaire

Here are the four questions included in the questionnaire. What kind of a heating plant do you have at the present time? Is your present plant satisfactory? What kind of a heating plant would you prefer if you were to make a change? Do you have an automatic stoker?

One of the largest jobs sold through doctors was closed directly through the recommendation of a doctor. Mr. Richey discovered that one of his prospects was taking treatments for sinus. Richey pointed out to the doctor the benefits of air conditioning in treating the trouble, and suggested that the "good word" be passed along to the other patient. The contract for the work was signed the

BIGGER
PROFITS

TYPE 144

Economical to Operate—very small current in the thermostat circuit.
Long Life—platinum iridium contacts, that show practically no signs of wear even after years of use.

Extremely sensitive thermostat—insuring instant, positive response to temperature changes.

Powerful, quiet motor and non-inductive starting switch.

Hooks up to regular lighting circuit. Easily and quickly installed.

Get all the facts. Write us today for full information, prices and discounts to dealers.

WHITE MANUFACTURING CO.

2362 University Ave.

St. Paul, Minn.

MASTER

HEAT REGULATOR

Add MASTER Automatic Control to Your Furnaces

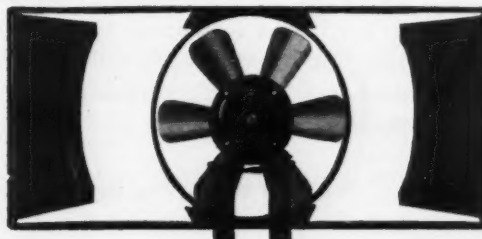
A large extra profit is your reward for installing the MASTER Heat Regulator. This equipment gives close, positive control of the fire and years of trouble-free service.

You need only to point out these features to prove to home owners why the MASTER gives exceptional satisfaction—

DRASTIC PRICE REDUCTIONS

ON DISCONTINUED AND OBSOLETE
Miles Furnace Fans and Blowers

Because of the favorable acceptance of the New Fan and Blower type Air Packages, we have available a limited quantity of Miles Automatic Furnace Fans and Blowers. Due to their exceptionally low price, these well known units offer an excellent opportunity for profit during the off season. Many of these units are selling at *far less than the cost of the motors.* It will pay to buy a stock now while they last.



SAVE UP TO

75%

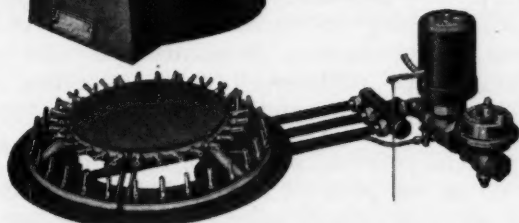
For detailed information and prices write to

Air
CONTROLS INC.
1960 West 114th, Cleveland, O.
DIVISION OF
THE CLEVELAND HEATER COMPANY



BARBER AUTOMATIC BURNERS

Illustrating No. 324-B Barber Automatic Burner installed in a round boiler. Note its simplicity of installation and the excellent scrubbing action of the flame.



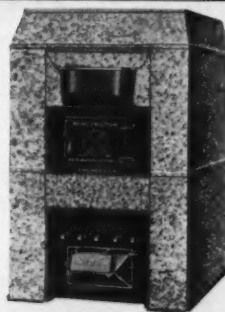
Our Engineering Department will gladly furnish you practical, as well as technical co-operation in specifying Barber Burner Assemblies to especially suit and fit the grate areas for which they may be required.

WRITE us today for our NEW CATALOG and our latest attractive DISCOUNTS. Let us tell you how we assist with literature and co-operation that will help you to capitalize on the demand for Barber Automatic Heat.

THE BARBER GAS BURNER CO.
3704 SUPERIOR AVE. CLEVELAND, OHIO

DEALERS

FOR PROFITS IN 1934 — SELL
HESS FURNACES



The Hess line includes Air Conditioners, Blower Filter Units—it is complete for all your needs.

BENEFACITOR

Furnace, at left, is our price leader. It will make money for any dealer.

GREATER VALUES—EASIER TO SELL

The Hess Furnace has uniform air chambers. Casing and inner steel body both square shape. Makes best air circulation. Fire brick brick lining $2\frac{1}{2}$ " thick. Down draft that really saves heat. Air space under entire steel body prevents usual heat loss to cement floor. More primary, direct, radiant, heating surface than other furnaces, makes it largely self cleaning—many other features.

WRITE FOR DEALER PORTFOLIO

HESS WARMING & VENTILATING CO.

1211-27 S. WESTERN AVE., Founded 1873
CHICAGO, ILL.

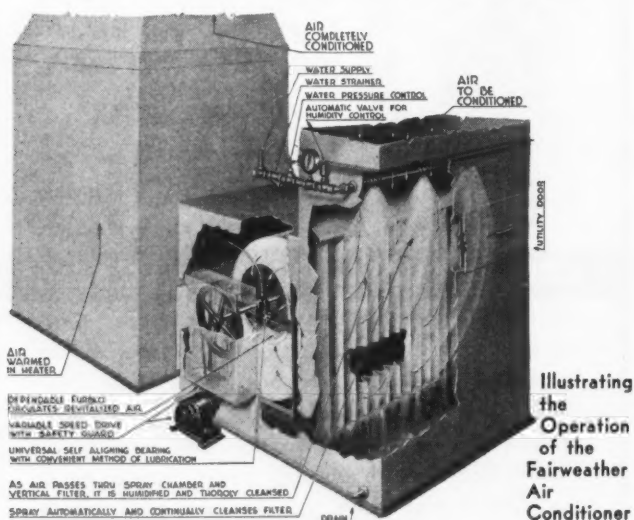
53 Manufacturers said O.K.

If the great variety of claims made for various air conditioning devices puzzles you—stop a moment and consider from this angle: Isn't it logical to suppose that a manufacturer who can completely satisfy half a hundred other manufacturers really has a worthy product?

We think so. We're proud of the fact that 53 furnace manufacturers including most of the *leaders* are specifying Furblo and Fairweather as standard equipment. In practically all these cases Lakeside products are being used by them exclusively.

They didn't pick Furblo and Fairweather haphazardly. *They couldn't afford to.* Each one made his own choice after the most exhaustive tests and experimentation. Each one *knew* he picked a product on which he could depend. And he preferred Furblo and Fairweather although cheaper quality at a cheaper price was offered him on every side.

53 Manufacturers say "O. K." And that's a mighty O. K. you can rely upon.



The LAKESIDE Company
HERMANVILLE, MICH.

Manufacturers of the Furblo and Fairweather Air Conditioners

next day, the prospect's decision being based largely on the medical recommendation.

Architects, too, have come in for a good share of attention from the Aurora firm. He has sold four major jobs, one for a \$25,000 home, which amounted to nearly \$1,500, directly through a single architect. The interest and cooperation of this man were secured entirely through personal solicitation.

Several years ago, Richey called on this architect to solicit furnace business. The architect gave Richey a job to figure. As far as the architect was concerned, the estimate was satisfactory, but he sent Richey to the man who was building the house, a wealthy old gentleman. The owner put this question: "I've all the money I can use and since I want this house for my own use, I want to be sure that I can be comfortable in it; what assurance have I that your system will heat it to 72 degrees at 10 below?"

Richey's response was: "If you'll pay the interest on my investment, I'll put in the job and wait for payment until the thermometer hits 10 below. If my system doesn't give you 72 degrees, you won't owe me a cent." Richey's was the highest out of 16 bids, but he got the job—and during the first cold snap he got his money with interest.

"This incident illustrates the fact that it pays to see that every job installed gives 100% satisfaction," Richey pointed out. "This is particularly true in connection with air conditioning because it is something prospects must be shown in operation before they can be sold. Almost every air conditioning job I have sold has been the result of a demonstration of an old job.

Shows Completed Jobs

"One of my first steps in developing a prospect is to pick out an installed job similar to the proposed one, and send the prospect out to examine it and talk with the owner. I have found it much better to stay out of the demonstration, letting the owner do the talking. This way, the prospect feels that what is said is genuine, that there isn't anything pre-arranged about the demonstration. If an owner is sold on his job, he is proud to demonstrate it."

Another thing that has played a highly important part in Richey's selling program is the use of blueprints in figuring with prospects. After making a thorough study of a proposed job, he usually draws a complete set of plans, has them blueprinted and takes them back to the prospect. Accompanying the set of blueprints is a report for each room, showing glass, net wall, ceiling and floor, cubical contents, B.t.u. loss per hour, cubic feet per hour, pipe and register sizes, location and number of registers, etc.

"The principal purpose of these plans is to impress on the prospect that you are giving time and conscientious effort to his job, and that you know what you are doing," says Richey. "The average prospect doesn't know what you are talking about when you explain the blueprints and reports, but he is given confidence in you. We find that getting the plans down on paper beforehand has another advantage in that they enable us to see the job more clearly ourselves, and consequently to be in a better position to answer any questions the customer may have."

What is Comfort?

(Continued from page 36)

tained at the expense of some conscious bodily adjustments.

The discussion in the preceding paragraphs has been confined to the consideration of a sedentary individual. Different degrees of bodily activity naturally result in different rates of heat production in the body. For each degree of activity, however, the heat loss must be equal to the heat generated if comfort is to be maintained. The measured heat losses for different amounts of bodily activity are shown in Fig. 3. This loss ranges from 400 B.t.u. per hr. for an individual at rest to 1300 B.t.u. per hr. for an individual

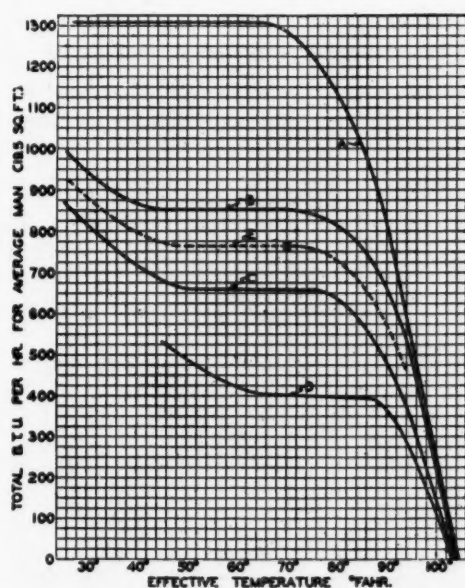


Fig. 3—Relation between total energy loss from the human body and Effective Temperature for still air. Curve A—men working 66,160 ft.-lb. per hour. Curve G—men working 33,075 ft.-lb. per hour. Curve X—men working 16,538 ft.-lb. per hour. Curve D—men seated at rest. Curves A and C drawn from data at effective temperature of 70 deg. only and extrapolating the relation between curves B and D, which were drawn from data at many temperatures.

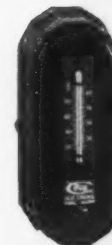
doing work at the rate of 66,160 ft. lb. per hr. For each degree of bodily activity shown in Fig. 3 the heat loss is constant over a different range of effective temperatures; and in each case, some portion of the range represents the effective temperatures at which no conscious bodily adjustments are necessary, and which must be maintained if comfort is to exist. The problem of the engineers and physiologists was, therefore, to find the combinations of environmental factors that produce effective temperatures corresponding to these various ranges.

Under normal conditions, where the temperature of the surrounding walls does not differ materially from that of the air, comfort is largely a matter of air temperature, air motion, and relative humidity. The latter can be represented by wet-bulb and dry-bulb temperatures, observed by means of a sling psychrom-

When you buy

COOK CONTROLS

You get quality apparatus that is thoroughly reliable, and successfully operating on all types of warm air heating plants.



Control equipment is the heart of every job and it pays to buy good controls.

COOK HEAT CONTROL

Thermostatic operation of Check and Draft Damper.

CONTROLS FOR MECHANICAL CIRCULATION

Hard fuels, oil, gas or stoker fired.

CONTROLS FOR AIR CONDITIONING INSTALLATIONS

CONTROLS FOR TWO FLAT BUILDINGS

One furnace, thermostat in each flat.

ZONE CONTROL FOR LARGE INSTALLATIONS

THERMOSTATS, FURNACE SWITCHES, RELAYS

Write for full information today.

COOK ELECTRIC COMPANY

2710 SOUTHPORT AVE., CHICAGO

Wanted---Bids

on schools, gymnasiums, public halls

Financial aid for public work by the Federal Government is making possible the completion of community projects requiring heating and ventilating.

You can be prepared to submit bids on this type of work at small expense by using the plan service of a consulting engineer. Preliminary plans or complete details prepared from architect's plans.

Special prices for all types of cooling and air conditioning installations.

48 hour service

Study these low prices—

PUBLIC HALLS, GYMNASIUMS

Up to and including 50,000 cu. ft. gross content.....	\$0.12 per 1,000 cu. ft.
50,000 cu. ft. and over.....	\$0.10 per cu. ft.

SCHOOLS

20,000 to 50,000 cu. ft.....	\$0.30 per 1,000 cu. ft.
50,000 to 70,000 cu. ft.....	\$0.25 per 1,000 cu. ft.
70,000 to 100,000 cu. ft.....	\$0.20 per 1,000 cu. ft.
100,000 cu. ft. and over.....	\$0.15 per 1,000 cu. ft.

Also steam, hot water, vapor systems at 1 cent per square foot of radiation. Combination systems at similarly low prices.

Write for complete information.

Platte Overton

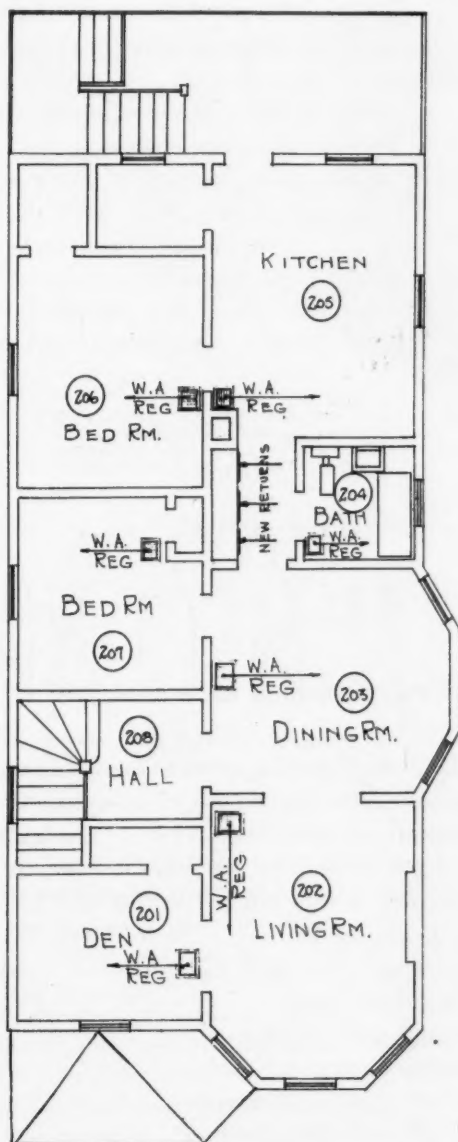
5236 West Huron Street Chicago, Ill.

A. A. Test House

(Continued from page 34)

207-206 as it was observed that exfiltration was taking place.

All the inlet temperatures and air supply items are the average for gravity and blower supply. In rooms 205-206 the velocity and inlet temperature readings varied but little with either the "on" or "off" service of the blower. The type of stack connections (a box) on these second floor runs are



SECOND FLOOR
Ceilings 9'-6"

All second floor stacks are 12 by 3½, with the result that the stack serving rooms 205-206 has to carry 285 c.f.m. at a stack velocity of 985 f.p.m. There are only four stacks; three carry two registers each, as follows—205-206; 204-207; 201-202; and a single, 203.

not ideal for high velocity and low pressure losses. Rooms 105-205 show low air supply and inlet temperature as compared to B.t.u. loss. However, this difference is compensated for by the radiant heat

**AIR CONDITIONING
CONTROLS**

for

*Domestic or
Commercial
Installations*



MINNEAPOLIS-HONEYWELL Air Conditioning Controls govern all phases of this work, including heating, cooling, ventilating, humidifying or dehumidifying. There are controls for every application, each designed to accomplish its particular function with characteristic Minneapolis-Honeywell accuracy and efficiency. Minneapolis-Honeywell Regulator Company, 2726 Fourth Avenue South, Minneapolis, Minn. Branch and distributing offices in all principal cities.

The Humidistat. Very accurate, with exceptionally small differential. Range 20 to 80 per cent relative humidity . . .

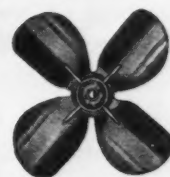
MINNEAPOLIS-HONEYWELL
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TORRINGTON
FANS AND
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Patented All Aluminum Multiblade, Balanced Blower Wheels. Unexcelled for quiet and smooth operation.

32 years' experience building Propeller Fans—sembled, balanced and tested ready to mount on motor shaft.

THE TORRINGTON MFG. CO.
14 FRANKLIN ST.
TORRINGTON, CONN.

**For Registers**
Specify **WATERLOO**

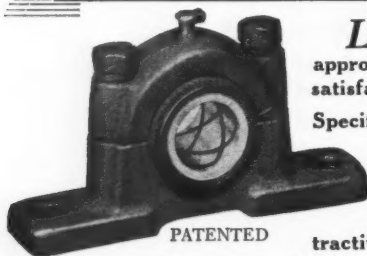
with rod operation
for high walls

Illustrated Catalogue on Request

THE WATERLOO REGISTER CO., Waterloo, Ia.
Also 2211 First Ave. Seattle, Wash.

DIEFUSER

STANDARD EQUIPMENT



LEADING manufacturers' approval is your guarantee of satisfaction.

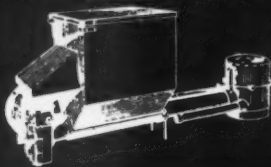
Specify Randall Pillow Blocks on your blower, fan and air conditioning units. Write for detailed catalogue and attractive prices.

RANDALL
Self-Aligning, Self-Lubricating
PILLOW BLOCKS

RANDALL GRAPHITE PRODUCTS CORP.
609-613 West Lake Street, Chicago, Illinois

FINDLAY

A Dependable Line—



upon which to build a permanent and profitable business. Domestic, Commercial and Industrial Sizes.

MANUFACTURED BY
THE BLUFFTON
MANUFACTURING CO.
FINDLAY, OHIO

STOKERS

WRITE FOR COMPLETE INFORMATION

INDEPENDENT "FABRIKATED"

Forced Air Registers

Many New Designs—in "Fabrikated" Construction
"Stream-Line"—unrestricted air flow;—
"Custom Built"—to meet individual needs;—
Correctly engineered;—

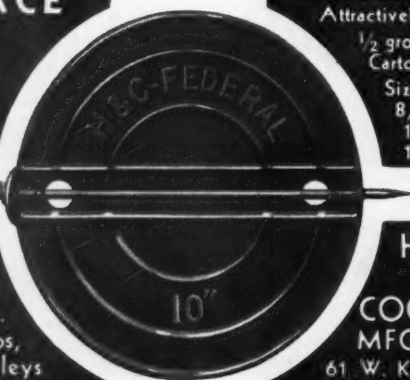
AGAIN—INDEPENDENT REGISTER—LEADS THE WAY

INDEPENDENT
REGISTER AND MFG. CO.

3741 E. 93rd St.
Cleveland, Ohio

The ACE
of
Dampers

Also a
Complete
Line of...
Clips & Tips,
Chain, Pulleys
Regulators, etc.



Reversible, Sturdy
Attractively Priced
1/2 gross to the
Carton
Sizes: 6, 7,
8, 8 1/2, 9,
10, 12,
14 inches

HART
&
COOLEY
MFG. CO.
61 W. Kinzie St.
CHICAGO

from the smoke flue. In room 105, 35 sq. ft. of brick plastered smoke flue at 175 degrees surface temperature helps to keep this room warm. This is also true of room 205 with 35 sq. ft. of flue at 100 degrees temperature.

Furnace—As approximately 117,627 B.t.u. per hour is delivered at the register faces, and there was 199,940 B.t.u. in the fuel as fired, we have $117,627 \div 199,940 = 59\%$ register efficiency.

It is evident that at a combustion rate of 2.71 pounds per sq. ft. of grate per hour, the furnace was operated below its capacity. Just how this effects the furnace efficiency remains to be seen.

The draft damper in the smoke pipe was closed completely during the entire test.

The response to the ashpit draft door was remarkable. The bonnet temperature rose 12 degrees in 6 minutes. No special effort was exercised in firing. Fuel was fired at 6:10 a. m., 10:30 a. m., and 2:00 p. m. The grates were not disturbed and fire was not poked or leveled.

Heater has a single casing not insulated, but at no time was the furnace room overheated or un-

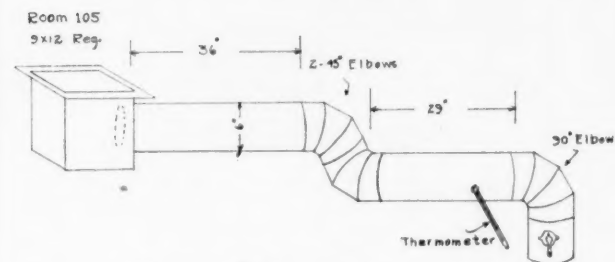


Fig. 7—Detail of run to room 105.

comfortable (average temperature being 74 degrees).

Typical performance—Fig. 7 is one of the two 6-inch leaders to room 105. One of the leaders is cut off at the furnace by the volume damper. The only elevation in this run is the rise of 8 inches in the two 45-degree elbows. The register is an old fashioned floor type with elaborate fret work and about 60% free area.

Average performance—

Velocity at register face:

Fan on—354 feet per min.

Fan off—140 feet per min.

Temperature at register face:

Fan on—145°.

Fan off—152°.

Temperature at thermometer:

Fan starts at 208 degrees.

Fan stops at 168 degrees.

An average of 54 seconds of blower action reduced the 208° to 168°.

Note that the inlet temperature difference at the register face is only 7 degrees, while the difference at the high temperature thermometer is 40 degrees. It was assumed that radiant heat affected the reading of the thermometer at this position.

*for the
Business Man*

**WHO IS READY TO SHARE IN
THE PROFITS OF
THE FASTEST-
GROWING NEW
GIANT INDUSTRY**



Floor-Type Comfort Unit—for the year-round control of the temperature, humidity, cleanliness, volume, and distribution of air.

An Opportunity **TO DISTRIBUTE A COMPLETE LINE OF**
AIR CONDITIONING*

You've watched Air Conditioning . . . watched it grow, swiftly, amazingly, into an industry of vast proportions.

But you've waited until you could get into Air Conditioning with a dominant line of equipment . . . a line that would match the potentialities of a rich market.

Today the opportunity you've waited for is here. Servel has brought Air Conditioning out of the "horse-and-buggy" stage. For 1934, it has perfected a line of modern equipment . . . so complete that it fills every Air Conditioning need, so advanced that you can sell it promptly, profitably.

Servel brings you floor and suspension-type comfort units for year-round Air Conditioning, self-contained room coolers, massive 7-ton and 10-ton refrigerating machines for heavy-duty installations . . . all based on the rich experience of a refrigeration pioneer . . . all as outstanding as Servel Electric Refrigeration and Electrolux Gas Refrigerators.



Add to this Air Conditioning line, if you like, the world's foremost Commercial Refrigeration equipment . . . machine units for every capacity, Humidraft chilling units, self-contained milk coolers, water coolers, beer bars.

Volume and profits await the business man who gets into Air Conditioning . . . today . . . with the line that is quickly taking the lead. Distributor and dealer franchises are now being arranged. Wire or write immediately for details of the powerful advertising and sales program. Servel Sales, Inc., Evansville, Ind.

SERVEL
Air Conditioning

AND COMMERCIAL REFRIGERATION

*True Air Conditioning performs many functions . . . cools and dehumidifies in Summer . . . heats and humidifies in Winter . . . circulates, filters, and freshens the year round. Servel Air Conditioning is complete Air Conditioning.



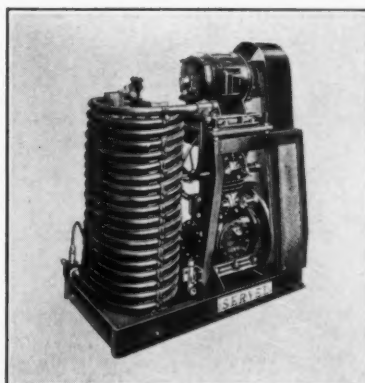
Suspended-Type Comfort Unit—for all-season, heavy-duty Air Conditioning. To be suspended from the ceiling or in wall ducts.



Self-Contained Cooling Unit—for Summer use. This "package job" is readily portable, and can be installed anywhere with ease.



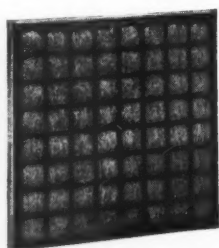
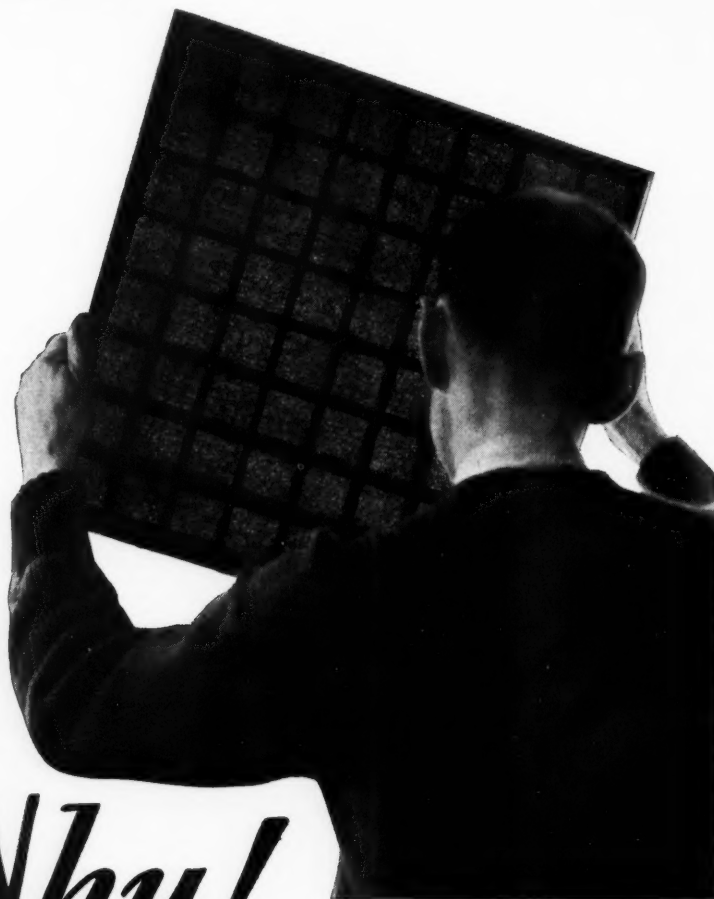
Suspended-Type Cooling Unit—for Summer use. Compact, efficient, powerful. To be suspended from the ceiling or in wall ducts.



Refrigerating Machine Unit—one of the big multiple-ton models developed for Air Conditioning and heavy-duty refrigeration.

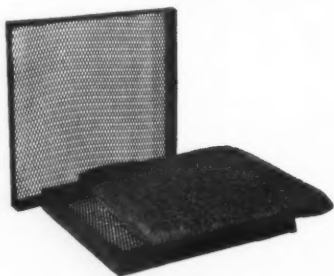
BETTER

..and Why!



THROWAY

The filter pad is in a cardboard container. Throw the whole unit away when used.



RE-NU

An all-metal renewable type furnace filter. Only the filter pad replaced.

2. UNIFORMITY

Held up to the light—American THROWAY or RE-NU Filters show no thin spots or holes where dust or dirt might leak through.

The patented process used in weaving the continuous ribbons of split-wire into uniform dust catching pads insures highest efficiency in every American Air Filter.

In addition, the coating of each strand of split wire, during the weaving process, with viscosine is further assurance of maximum cleaning efficiency and dust holding capacity.

Every American Air Filter, whether for domestic or industrial installation, has been carefully developed by our engineering department both as to construction and materials used.

Send for "*Profits from Clean Air*" covering our full line of American Air Filters. Engineering advice and other information is gladly supplied.

AMERICAN AIR FILTER CO., Inc.
113 Central Avenue **Louisville, Kentucky**
IN CANADA, DARLING BROTHERS, LIMITED, MONTREAL, P. Q.



AMERICAN AIR FILTERS

ASSOCIATION

Activities

Michigan

The annual state convention of the Michigan Sheet Metal and Roofing Contractors Association will be held in Grand Rapids, March 6, 7 and 8. Speakers and subjects are now being discussed and full information on the program will be ready shortly.

The Salesmen's Auxiliary will hold their meeting at the same time and the auxiliary is making the usual arrangements for the dinner and entertainment to be tendered the contractors during the convention.

F. E. Ederle,
Secretary.

Philadelphia

At the December monthly meeting of the Roofing, Metal and Heating Engineers of Philadelphia the following officers for 1934 were elected:

President—Roy Eichberg.
Vice-president—Charles Salinger.
Treasurer—Oliver Bartholomew.
Secretary—Fred U. Ritter.

Directors

J. A. Miller, J. Edward Linck, Irwin Prickett, J. B. M. Churchill, Walter Rhea, Edward Spence, John Frick, John Naegele, Jr.

A committee was appointed to take up necessary revision of the By-laws and to change the name of the association so that all branches of the trade as outlined in the National Code will be included.

Our association is anxiously awaiting final signature of the National Code and we expect to hold a mass meeting just as soon as word of the signing is received.

Building in general has fallen off somewhat but a considerable volume of Public Works construction is under discussion and it is hoped that several million dollars will be spent on various housing projects which have been proposed by Philadelphia organizations.

F. U. Ritter,
Secretary.

Waterloo, Iowa

The Sheet Metal and Furnace Dealers Association of Waterloo held their monthly meeting January 3, with ten officers and members present.

The financial status of the association is very encouraging and mem-

bers are anxiously awaiting the signature of the Code.

John G. Wright,
Secretary.

New York State

A conference of manufacturers, jobbers and contractors will be held in conjunction with the New York State annual convention April 9, 10 and 11.

The purpose of the conference is to establish a sound and workable basis between contractors and distributors for the promotion and sale of good equipment. All members of the association and visitors are invited to attend.

An interesting feature of the annual convention will be the local broadcasting of speeches of prominent men in the industry as they address the meeting. Albany and Schenectady newspapers are expecting to give the meeting adequate publicity.

The convention will be held at the Ten Eyck Hotel, Albany, New York. A display of equipment will be staged in conjunction with the meeting.

Considerable progress has been made in the formation and enlargement of local associations throughout the state and the number of contractors joining local and state associations has been increasing week by week. Progress has also been made in establishing the association's duty regarding mail order and chain store competition and the association is actively backing the formation of a code which will give every possible advantage to the independent contractor.

Adolph Hesse,
Secretary.

Canton, Ohio

At the December meeting of the Furnace & Sheet Metal Contractors Association of Canton and vicinity the following officers were elected for 1934:

President—Charles Wills.
Treasurer—Harry C. Fravel.
Secretary—Ralph J. Peters.

Twenty-five members attended the meeting and turkey dinner. Attention is called to an activity of this association, namely, the use of group advertising space in one of the Canton newspapers. All members of the association in good standing are listed

on the advertisement. The purpose of this group endeavor is to impress upon home owners that the association members are experienced, reputable, and financially responsible and that satisfactory work may be expected from any one member.

This activity has had excellent results and it is expected that it will be continued during the coming year.

Ralph J. Peters,
Secretary.

Chicago Local

The Furnace & Sheet Metal Institute, Inc., of Chicago, held their banquet and installation of officers January 20.

More than 300 persons were in attendance for the meeting and for the dinner and installation ceremonies. Dancing and entertainment were presented after the formal session.

The following officers were elected for 1934:

President, Jack Weiner.
Vice President, Louis Drehoel.
Secretary-Treasurer, M. L. De Wulf.

Gifts for the out-going officers, corsages for the wives of the officers and directors and souvenirs for everyone present were distributed.

Jack Weiner,
President.

Beaver Valley, Pennsylvania

The Beaver Valley Sheet Metal Contractors Association held their annual election of officers on January 9, and the following men will be installed into office at the next regular meeting:

President, Floyd Frischkorn.
Vice President, J. W. Lawrence.
Secretary, Charles J. Frye.
Treasurer, M. F. Lieberman.

Board of Directors

W. H. Davidson, George Mytinger,
George Zeller.

Conference Committee

W. W. Collar, J. W. Faller, H. G. Summerfield, S. H. Funkhouser, J. W. Frye.

The association, under the immediate supervision of a special committee, is now undertaking the task of furnishing instruction classes, restricted to members of the organization. These classes will be held every second and fourth Tuesday nights.

Association Activities . . .

Fox River Valley

The annual meeting of the Fox River Valley Furnace and Sheet Metal Contractors Association was held January 8, with 38 members in attendance. Every city in the association—Aurora, Batavia, Geneva, St. Charles, Elgin, Dundee, Hampshire, Oswego and West Chicago were represented.

Reports from Committees on Public Relations, Membership, Grievance, Auditing and Code were submitted and approved.

It was decided to charge an initiation fee after May 1 and considerable discussion was held on future rates for dues and assessments.

The following officers for 1934 were elected:

President—Jack Stowell.
1st Vice-president—William Wolf.
2nd Vice-president—Fred Goetz.
Treasurer—William Klinky.
Secretary—Elmer Borman.
Sergeant-at-Arms—M. W. Leedy.

Directors

Henry Heffelfinger, John A. Gengler, Andrew Lind, Fred Nolting.

The interesting speakers of the evening were two representatives from the local gas company who explained their company's merchandising plan for the sale of gas appliances.

Arrangements were made for the association's Public Relations Committee to meet with officials of the utility company to work out a plan whereby the furnace and sheet metal work in connection with gas appliance sales made by the utility company.

Jack Stowell,
President.

St. Louis, Missouri

The Sheet Metal Consumers' Protective Association, Inc., of St. Louis, held their election and installation of officers at the shop of C. T. Harris, 818 Hodiarnont Ave., on January 8. The following officers will take charge during 1934:

President, Luke Tierman, Jr.
Vice President, C. T. Harris.
Secretary, W. Cavallo.
Treasurer, Ben Kolbenshlag.

Directors

G. Frankel, R. Meier, T. J. Moran.

A Dutch lunch and get-acquainted party was enjoyed by the large number in attendance.

W. Cavallo,
Secretary.

Ohio State

The Ohio Sheet Metal Contractors Association will hold a board of directors meeting during the latter part of February to select the date and place of meeting for the association's 1934 annual convention.

The association has been active in promoting the growth of various local associations throughout the state and considerable progress has been made in making these local organizations active units of the state organization.

D. A. Mannen,
Secretary.

Milwaukee

At the meeting of the Sheet Metal Contractors Association of Milwaukee, held January 1, the following officers were elected for 1934:

President—R. G. Schmieder.
1st Vice-president—Adolph Schumann.
2nd Vice-president—R. Klubertanz.
Treasurer—F. Ward.
Secretary—P. L. Biersach.
Sergeant-at-Arms—F. Kremer.

The new officers will take active charge at the first February meeting, which is to be held February 14, at the Builders Exchange, 8:00 P. M.

At the January 1 meeting committee reports were submitted by the Code Committee, Trade Relations Committee, Fair Practice Committee and Auditing Committee.

It is expected that considerable progress in the work being carried on by the various committees will be made during 1934 and co-operation is expected of all Milwaukee members.

Paul L. Biersach,
Secretary.

National Warm Air

The mid-year meeting of the National Warm Air Heating and Air Conditioning Association will be held in the Morrison Hotel, Chicago, Ill., June 12, 13 and 14.

The usual interesting program is being developed and, in addition, the association proposes to hold a dealer's session to be devoted exclusively to the problems and discussions of and by contractors. The program for this session is being worked up.

Allen W. Williams,
Managing Director.

Danville, Illinois

At the meeting of the association on January 3, the following officers were elected for 1934:

President, W. L. Kimball.
Vice President, Edward Tillman.
Secretary-Treasurer, W. F. Lahr.

Trustees

Frank Kremast, W. R. Dietz, J. W. Boyd.

Publicity Committee

J. A. Schuman, Fred Smith.

Entertainment Committee

H. W. Drews, E. J. Drews.

Code Committee

W. H. Dietz, T. A. Schultz, R. F. Bireline.

The aim of the association during 1934 will be to secure better prices and better workmanship.

Refreshments were enjoyed following the meeting.

W. F. Lahr,
Secretary.

Wisconsin Meeting

(Continued from page 24)

nance is the "guidance" and "control" of any business activity. "The principal need today," declared Mr. Ellison, "is the ability to think and in exactly the proportion of thinking to non-thinking can we find the answer to why some firms progress while others do not. Too many of us only think we think," was one of this speaker's interesting suggestions. "There are two human faults—we are either too egotistical or too prone to follow the other fellow. Each of these faults leads to trouble and it is only by thinking that we can chart our course to success. There are three important phases of business maintenance—buying, selling, financing. All these are equally important and no two can succeed without the other." The speaker declared that seventy years of business history, as shown by his company's books, indicated that the best method of getting customers is shop display and contact with customers.

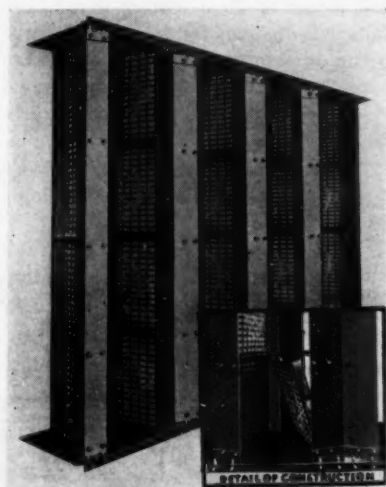
Remarks by other association standard bearers: Jack Weiner, President, Furnace & Sheet Metal Institute, Chicago, Ill.; Paul Barth, President, Master Furnace & Sheet Metal Association, Chicago, and Chas. Gatz, Chairman, Gary District Local, Gary, Ind., were delivered from the floor.

New PRODUCTS

Filter Frame

A new "V" type filter frame suitable for application in ventilating systems of commercial and industrial buildings is announced by Owens-Illinois Glass Co., Toledo, Ohio.

The frame saves 40 per cent of the frontal area required by any other type and the unit is so designed that filter units can be quickly inserted in



the frame. Air turbulence is avoided by the arrangement used and a uniform throat opening is accurately proportioned to give uniform distribution of air flow.

The frame is so designed that rapid and easy installation is made possible by interchangeable parts and erection requires only a screw-driver and wrench.

New Blowers

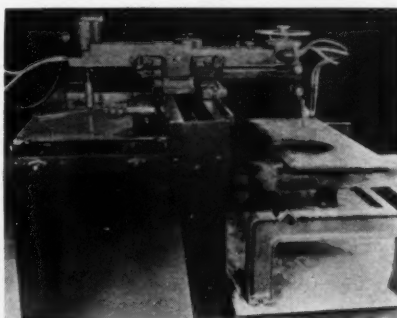
Peerless Electric Co., Warren, Ohio, announce a new line of Peerless motors for belt-driven blowers and a new belt-driven blower.

The motors are of the capacitor type with rubber mountings and are set to meet all requirements for low starting current and consumption.

The new blower is a completely housed unit with an all-welded cabinet and has four capacities from 1200 to 4000 c.f.m., with quiet operation at the high speed. A variable pitch motor pulley is provided for the selection of proper capacities. The blower comes complete with all required canvas and felts for connection to the furnace.

Cutting Machine

A new stationary cutting machine known as the "Pantosec" especially suitable for cutting dies, cams, or any other parts requiring smooth and ac-



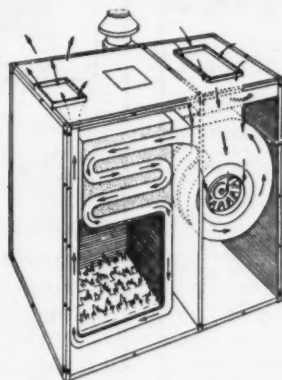
curate cutting is announced by Linde Air Products Co., 30 East 42nd St., New York City.

The machine has a cutting range of 44-inches longitudinally and 20-inches laterally and will do straight-line, angle, circle or intricate shape cutting in addition to beveling.

The machine can be operated from either the templet or blow pipe end, as a hand-guided or as a machine-guided instrument.

Hot Cold Conditioning Furnace

The Edwards Manufacturing Company, Cincinnati, Ohio, point out that their HOT-KOLD winter air conditioning system is not an auxiliary unit to be tied in with other warm air furnaces as shown in our November



issue, but a unit in which the air is introduced at the upper right from the return air duct, exhausted from the upper floors by the blower unit, introduced into the upper passes of the heat exchanger, propelled down

through the low passes completely around the burner chamber, up and out of the upper left through the outlet where the air is humidified before going to the upper rooms. The Edwards HOT-KOLD is therefore, a central, direct-fired winter air conditioning system.

Air Conditioner

Russell Electric Co., 340 West Huron St., Chicago, Ill., announce a new air conditioner of the self-contained, fan-motor-filter type housed in a complete cabinet ready for connection to the return air system.

Four sections of filter are used mounted in V-formation in the top of the cabinet with the special pressure fan located below the filter section. The fan and motor are of the same



type as the pressure fan recently announced by this company.

The characteristics announced by the company are silent fan operation, small drain on the house, current in starting and stopping, one size for all installations with adjustments for fan speeds and complete automatic control.

The new unit will be sold under the trade name "Hold-Heet." Literature describing the equipment has been prepared and will be supplied contractors.

National Meeting

(Continued from page 20)

of the cost for formation of Code and its future execution?"

Chapter 1. Construction Industry Code says that the cost shall be paid by **all members of the industry** or words to that effect. Mr. King said that we could assess but it was a question if we could collect, now in law department, but with the registered number on the Roofing and Sheet Metal Eagle no shop can afford to be without one, and with the administration requesting the public to deal with the registered compliance seems likely.

Suggestions were made to assess by man, by volume, and per shop, but as the Conference Committee had no record of the expense incurred, or any idea as to how much would be required to conduct the administration of the Code, a motion was made to leave decision to the National Code Authority Committee of twelve.

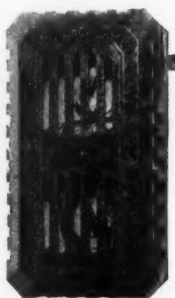
Each local Code Administrative Authority as elected was ordered to make a survey and a list of every shop in its area and report to N. C. A. It is probable that bills will be sent, similar to the retail code, \$1.00 per em-

ployee, 25 cents for National and 75 cents for local.

Non-union shops were in the majority and many questions were asked as to how they may bargain collectively with their men. No definite instructions were given, but the thought is that if an association is to have charge of the Local Authority that it could instruct each employer to inform his men as to their rights and report to him and he in turn would report to the Local Authority, or they could deal direct with the Local Code Authority.

Newport Humidistat

A small size humidistat attractively housed and furnished in colors to



match any decorative scheme is announced by Johnson Tool Co., 65 Mas-

sasoit Ave., East Providence, R. I.

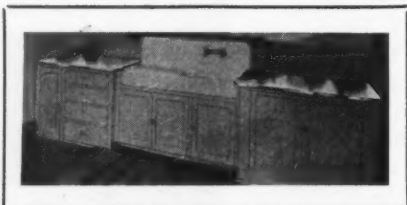
The company states that the instrument is so designed that installation is simplified and the unit can be attached to any standard type wall switch box. An adjusting lever is furnished to regulate the degree of relative humidity and is moved across a graduated scale. A mercury switch is used to make and break the electrical circuit.

Helico-Centrifugal Separator

A new separator built on the simple Helico-Centrifugal principle is announced by The Swartwout Company, 18511 Euclid Ave., Cleveland, Ohio.

The helix or "cork screw" device is located near the inlet of the separator. This device gives the entering air or other vapor a whirling motion. Any liquid or solid matter that is entrained is thrown by centrifugal force to the outside of the separator, where it collects, runs down and is drawn off. The action that goes on within a vertical separator is based upon a simple application of one of nature's most fundamental and dependable natural laws.

These separators are made in all desirable sizes, styles and capacities. They are used in every industry where such separation is required.



On Your Next Work Table Job
Recommend

Apollo ChromCopper

A sheet equal to the finest alloy metal, at one-half the cost. Used by industry on bars, ice cream cabinets, restaurant equipment, washing machine tubs. Used by sheet metal men on range hoods, novelty boxes, drain boards, etc.



Write for free sample and prices. Your jobber will supply **Genuine APOLLO ChromCopper.**

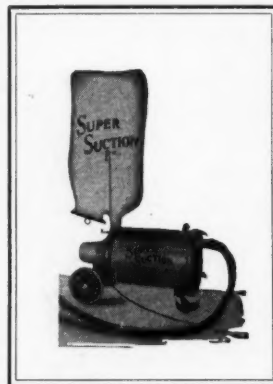
See Page 18, Annual Directory Number for additional particulars.

APOLLO COMPANY

Box AA

La Salle, Ill.

Clean Them All With One Outfit



**Furnaces
Chimneys
Air Ducts
Smoke Pipes**

New special tools for cleaning chimneys, air ducts and smoke pipes are now **standard** equipment with every

Super Suction Furnace Cleaner at no increase in price. Here you get more for the same money instead of paying more for the same outfit.

The choked chimney—the plugged pipe—the dirty air duct must also be cleaned as well as the furnace to enable the heating system to function properly. Now more than ever you need complete up-to-date profit-earning equipment. Here is the one furnace cleaner that meets every need. Write for detailed data and free trial offer.

The National Super Service Company
1944 No. 13th St., Toledo, Ohio

The Education of a Moujik

By Ivan Nitchewo

WHEN Soviet Russia recognized these United States and diplomatic courtesies were once more exchanged between these two countries, there also took place an interchange of commercial activity.

The Moscow Heating and Ventilating Company, owned and operated by Feodor Rivetski, was having tough going. Old Feodor called his oldest son, Feodor Jr. into the hovel that was their office and said: "My son, it is time that you went out in the world and absorbed wisdom. I want you should go far from your home to America and in that land of plenty maybe you could pick up a concealed idea or two that you could bring back that would help us run our business, so that maybe we could make us a living." Feodor Jr. (being a dutiful son, wise-cracked the Russian equivalent for "O. K., Pop," and wrapping his hammer and snips in a sheep-skin overnight bag, set out and traveled as far

as his passport and kopecks would permit.) We next discover him in a large mid-western city in the United States. (Time out for an intermission.)



He would probably have

departed these shores in disgust if it had not been that a dinner was being given for a noted Russian pianist at a large hotel, when the manager found that his samovar had a cracked cylinder. The manager's frantic call for a mechanic to fix the samovar arrived at the Apex Sheet Metal Shop at the same moment that Feodor Jr. was applying for a job.

All of the mechanics being out of the shop at the moment, the boss, in desperation hired Feodor Jr. and sent him to the hotel where he welded the cylinder, cleaned the flues, re-tubed the radiator, ground the valves, simonized the body, hauled the ashes, replaced the grates, reset the thermostat and turned out a thorough samovar over-hauling job.

Then the manager gratefully announced to the boss that he wanted Feodor Jr. to do all his future repair work and that put our moujik on the Apex payroll for keeps.

(to be continued)



Who Says Iron and Entertainment DON'T MIX?


AT first glance it's a far fling from easy-working, durable iron to entertainment for the millions . . . But listen to what a leading contractor in Bradford, Ohio, has to say: "I know by experience that your INGOT IRON sheets are okay; for we have used them a long time. I also know that your Armco broadcasts are advertising your good iron splendidly and that they are helping me to sell more and more of it." ● It's one thing to make and deliver a "good iron" and something else to help you sell it at a profit. ARMCO does both, as many successful contractors know—through national radio advertising, through that informative monthly paper, INGOT IRON SHOP NEWS, through many trade papers and through productive mailing pieces and other dealer-aids. Ask your Armco Distributor about these plus values that go with your use of INGOT IRON.

THE AMERICAN ROLLING MILL COMPANY

Executive Offices: Middletown, Ohio



THE SHOP-SAVING IRON
THAT SELLS EASIER



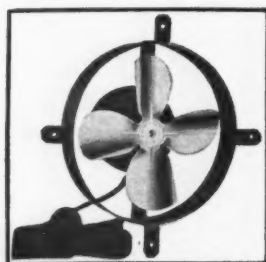
12"
LIST PRICE
\$19⁰⁰

16"
LIST PRICE
\$26⁰⁰

**DO YOU WANT
More
VENTILATION
PROFITS?**

The New VICTOR FORCE AIR

ARE you getting your share of the revival in ventilation? Public works, Modernization and Repeal are all contributing to the increasing demand for dependable ventilation equipment and Victor Force Air Ventilators will help you get lots of jobs.



FORCE AIR JR.
6" — List Price **\$4⁹⁵**

VICTOR HEAT BOOSTERS



Cure Any Cold Room

When you hear a furnace owner complaining about having a room that's hard to heat—that's your signal for a Victor Heat Booster sale. This amazing invention will correct the trouble in a hurry and it will only take you about two minutes to install it. Send for complete information at once!

only \$5⁹⁵ List

Wall Type \$6.95

Fits Your Needs

Here is a complete line of dependable exhaust fans—6 inch to 16 inch—priced to show you a good profit. They're rugged and able to stand tough use—the powerful Victor motor gives them exceptional air-moving capacity—and they have been designed for easy installation.

Fully Guaranteed

Every Victor Ventilator is fully guaranteed. Even the Force Air Jr. is certain to perform perfectly. This little six inch job can lead you into hundreds of profitable jobs in homes, institutions, factories and stores. It is designed particularly for hood and flue installations. Let Victor show you how to build up a money-making ventilation business—mail the coupon below, today!

Mail Coupon Now!

VICTOR ELECTRIC PRODUCTS, INC.
712 READING ROAD, CINCINNATI, OHIO

Gentlemen: Kindly send us complete information on your line of Force Air Ventilators and tell us how we can get more Ventilation business.

Name

Address

☐ Check here if also interested in Victor Heat Boosters.

News Items

Elwood Appointed "Dustop" Sales Manager

Announcement is made by the Owens-Illinois Glass Company, Toledo, Ohio, of the appointment of James L. Elwood as sales-manager for "Dustop" glass-wool air filters.

Mr. Elwood, since joining the staff of the Owens-Illinois Industrial Materials Division early in 1933, has been sales manager of "Dustop" filters for Zone 1, comprising Toledo and surrounding territory.

He relieves Division Manager J. S. Irvine of some of the duties of direct sales management of this product in



order that he may devote more time to the development and promotion of other products of the Industrial Materials Division.

Mr. Elwood, who holds an M. E. degree from Cornell University, has had long previous experience as an executive in the General Motors Corporation.

F. L. Myers continues in active charge of sales and engineering of "Dustop" as applied to warm-air furnaces and air conditioning. For 20 years prior to his joining the staff of the Owens-Illinois Glass Company's Industrial Materials Division, Mr. Myers was actively engaged, with others and in his own organization, in every phase of the warm-air heating, sheet metal construction and ventilation business.

Republic Steel Appointments

Harry W. McQuaid has joined the metallurgical staff of Republic Steel Corporation, according to announcement made by Earl C. Smith, Chief Metallurgist. Mr. McQuaid is a leading pioneer in grain size control and collaborated in the development of the McQuaid-Ehn test which bears his name. He will devote his time with Republic to research and development work.

Other changes incident to the broad metallurgical program under way at Republic include the transfer of Howard W. Burkett from Youngstown to the post of metallurgical engineer of the Buffalo district; the appointment of Elmer Larned in a similar capacity in the Chicago district and the acquisition of Harold T. Blair, metallurgical engineer, who will specialize in tin plate products. Karl Kautz, ceramic engineer, also has joined the Republic organization, and will specialize in research and field service on enameling sheets. M. J. R. Morris and E. R. Johnson will continue in their respective metallurgical capacities in the Central Alloy District, where all of Republic's stainless steel and much of the alloy steel are produced.

News Items

Michigan State Annual Short Course

Announcement is made that on March 26, 27 and 28 a short course in forced warm air heating and air conditioning will be given at Michigan State College, East Lansing, Mich.

A definite program has not been prepared as yet but it is announced that the course will follow complete design and layout of a residence installation with specialists to lecture and demonstrate methods of design regarding air cleaning and washing, register location, velocities, automatic control, draft problems, combustion, conversion and summer cooling.

Arrangements have been made whereby students may obtain very low-cost board and lodging near the college and the registration fee will be very nominal.

Full information on the course may be obtained shortly by writing the Michigan State College.

E. A. Francis Buys Am-Pe-Co

Announcement is made by E. A. Francis that he has purchased the American Machine Products Company, Marshalltown, Iowa, manufacturers of the Am-Pe-Co rotary blower, Am-Pe-Co washer-blower and air conditioning equipment.

The name of the company and of the products will be continued as in the past. Improvements and additions in the units are under way and will be announced from time to time.

Reorganize Riester and Thesmacher

Men interested in the old Riester and Thesmacher Company, pioneer Cleveland, Ohio, sheet metal contracting firm, have organized the R. & T. Company with 250 shares of no par common and 100 shares of no par preferred.

Officers of the new company are Milton A. Thesmacher, son of the late George Thesmacher, president; A. E. Riester, one of the founders of the original company, vice-president; D. V. Burt, secretary-treasurer.

The new company has purchased the personal property and machinery of the plant at 1526 West 25th Street, Cleveland, and has leased a two-story building and a second two-story building across from one another on Aust Avenue, N. W.

The company will specialize in the manufacture of sheet metal products and other special equipment.

Interstate Machinery Purchase

Interstate Machinery Co., Inc., 130 South Clinton St., Chicago, announce they have purchased from the David Lupton's Sons Plant, Philadelphia, approximately five carloads of machinery.

A list Number DLS is available to anyone interested in knowing about this equipment.

The company has also put out a partial list—"Bulletin No. 835"—describing a modern sheet metal shop requirements. This also can be had for the asking.

New Rudy Distributor

Beall Bros. Supply Co., with main offices at Alton, Illinois, has been appointed exclusive Rudy distributor for 16 counties throughout southwestern Illinois. A complete stock of furnaces and conditioning equipment will be carried.

Take it TO THE JOB

Whether for heavy duty in the shop or light duty *on the job*, the Viking Shear will serve you faithfully, day in and day out. By taking it to the job, you institute remarkable savings in time and in labor. Write for Viking particulars.

VIKING SHEAR CO.
ERIE PA.



THE VIKING SHEAR

PERFORATED METALS

Brass, Bronze, Copper, Steel, Stainless Steel, Aluminum, Monel, Zinc, Tin Plate, Lead, or any other sheet material perforated to your order. Perforations in rounds, oblongs, squares and special shapes. Complete stock of brass and tin in small sizes.

Accurate, durable product. Send us your next specifications.

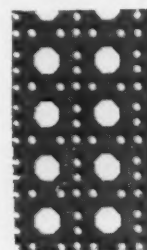
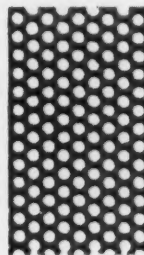
FOR
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RADIATOR
ENCLOSURES

SAFETY
GUARDS

And for all screening
and sizing operations.

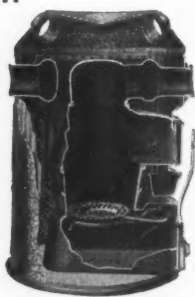
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Moncrief Furnaces are tried and proved—thoroughly dependable in every respect. Quality built, Moncrief Furnaces are ever progressive in design, including every latest improvement that makes for better home heating.

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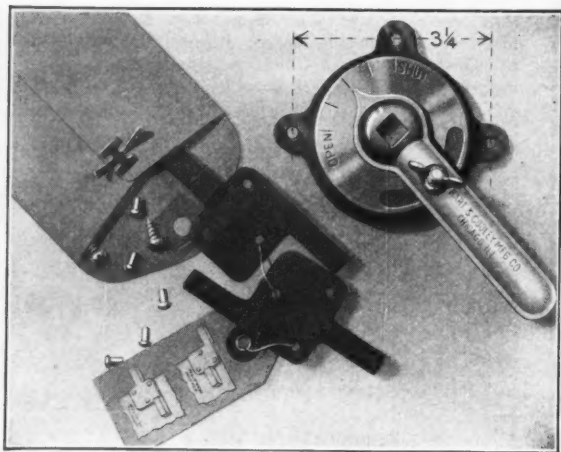
CAST and STEEL FURNACES
GAS FURNACES
AIR CONDITIONING SYSTEMS

We supply everything used on a warm air heating job.

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Branches and Distributors in principal cities.

For Greater Convenience and Economy, Too, Use H & C Complete Damper Regulator Sets



$\frac{3}{8}$ " Size—Set No. 70 $\frac{3}{8}$

Regulator, screws, rivets and a pair of combination (regular and splitter) bearings are all contained in one envelope—positive assurance that all parts will be at hand when needed. Regulator has inner disc which moves with handle closing the slot and preventing air leakage. Cadmium finish, sturdy, attractively priced. $\frac{1}{4}$ " size, Set No. 70 $\frac{1}{4}$, is similar, except that regulator has two instead of three lugs. Regulators and bearings also furnished separately. Carried in stock by leading jobbers.

HART & COOLEY MFG. COMPANY

61 W. Kinzie St., Chicago, Illinois

News Items

Wants Literature

Arthur F. Fritz, 519 Remington St., Rochester, N. Y., will be pleased to receive copies of catalogs and literature also discount sheets furnished to contractors by manufacturers.

Richard E. Mackey Dies

Richard E. Mackey, president of Stockhoff Supply Company, St. Louis, Missouri, and a well known figure in heating and sheet metal association work, died very suddenly from heart disease on Saturday, December 23, at the age of 66.

Mr. Mackey was for many years connected with the firm of Tipton and Mackey in St. Louis, until 1918, when he joined the Stockhoff Supply Company. In 1915 Mr. Mackey was elected president of the St. Louis Sheet Metal Contractors Association and had a host of friends who will mourn his loss.

Mr. Mackey's nephew, R. Frank Mackey, who has been managing Stockhoff Supply Company for the past four years, will continue as manager.

David Levow Enlarges Line

David Levow, 308 W. 20th St., New York, announces that he has taken over the sales of Whitney gutter hangers to be sold to jobbers only.

The shanks are standard and interchangeable with other makes. The circles are of strong construction, with a stop on the back of the circle which is the full height of shank and removes the strain from the bolt.

Champion Furnace Pipe Co.

Announcement is made that the Champion Furnace Pipe Co. have recently incorporated and purchased from Harry A. Frankel, trustee, the business of Chas. Johnson Co., Inc. The new company will specialize in the manufacture of furnace fittings as in the past and also fittings for air conditioning systems.

The officers of the new company are Chas. Johnson, president; C. G. Johnson, vice-president; Wm. D. Upton, secretary-treasurer.

Mr. Upton was for over twenty-four years connected with Isaac Walker Hardware Co. of Peoria as an executive and has a large acquaintance in the hardware trade of Illinois.

Dornback Purchases Plant

The Dornback Furnace & Foundry Co., announces the purchase of a new foundry at 1178 East 134th St., Cleveland, Ohio.

The company will produce a line of warm air furnaces. Offices and warehouse will be continued at the company's former address—724 East 103rd St., Cleveland.

New Williamson Branch

The Williamson Heater Co., Cincinnati, Ohio, announce the opening of a Michigan state branch at 5301 Grand River Avenue, Detroit, Michigan. O. E. Jennings is the manager in charge of this branch and will look after the merchandising and distribution of the company's products throughout the state of Michigan. He will carry at this address a stock of furnaces for the dealer trade in Michigan.

News Items

American Sheet and Tin Plate Changes

American Sheet and Tin Plate Co. announces the following changes in organization:

Fred M. Fuller, assistant general manager of sales, is appointed general manager of sales, J. I. Andrews continuing as vice-president in charge of sales. George G. McGlaughlin, assistant manager of sales in Cincinnati office, is appointed assistant general manager of sales in Pittsburgh. W. Arch Irvin, assistant to vice-president, is transferred from the operating to the sales department. Walter C. Carroll, of the general sales office in Pittsburgh, is appointed manager of sales in New York office.

Fox Celebrates Fiftieth Anniversary

Just 50 years ago, back in the days of bicycles built for two, coal oil lamps and horsehair sofas, F. B. Fox, who previously had been the agent for the Richmond Stove Company, organized the Fox Furnace Company.

In 1894 Henry Wick purchased the young company and assumed its management, with Ernest C. Fox, son of the founder, continuing his association with the organization for some time thereafter. Ernest C. Fox, proprietor of the Independent Register Company of Cleveland, has continued his activities in the warm air heating field.

In 1900 a new factory was bought in Elyria, with a floor area of approximately 37,000 square feet. The business today occupies approximately twenty-five acres.

The American Radiator Company purchased control of the Fox Furnace Company in 1923. The manufacture of heating stoves and ranges was stopped and production was concentrated on warm air heating equipment. The products, known by the trade name of Sunbeam, now consist of cast iron and boiler plate furnaces, gas fired furnaces and residential air conditioning units for all fuels.

The first catalog, a 36-page booklet, probably issued in 1896, reveals many interesting facts about early furnaces, such as one-piece, cast iron, horseshoe radiators, a dust flue to "connect the ash pit and combustion chamber so that dust created by the shaking or dumping of the ashes is conveyed by a natural draft into the smoke flue and not into the cellar," and the air tube which drew circulating air "directly over the hottest portion of the fire, warming the air with great rapidity."

On the subject of Water Pans the catalog has this to say: "There is a diversity of opinion among furnace manufacturers and dealers as to the value of pans for the evaporation of water."

A promising future for warm air furnaces made the year 1884 particularly auspicious for the launching of the Fox Furnace Company. Now, as the organization marks its golden anniversary, another new product, the residential air conditioning unit, makes the year 1934 an equally auspicious milestone.

Patents Upheld

In a recent patent infringement suit between The Cheney Company, Winchester, Massachusetts, and E. Van Noorden Company, Boston, Massachusetts, the district Court of the District of Massachusetts has adjudicated The Cheney Interlocking Wall Flashing Patent No. 1,715,000 to be a basic and pioneer patent in the art and one that is entitled to a broad range of equivalents. The same court also held the Cheney Patent No. 1,860,240 as a valid patent and an improvement in the art.



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When you sell your customers Canton Steel Ceilings you assure them ceilings of *lasting beauty*... but further, and of even more importance... you assure yourself a share of the *bigger profits* now going to contractors installing Canton Steel Ceilings. Learn more about Canton... and how Canton will help you make more money. Write for catalog and dealer helps Canton Steel Ceilings are sold thru leading sheet metal jobbers in the United States.

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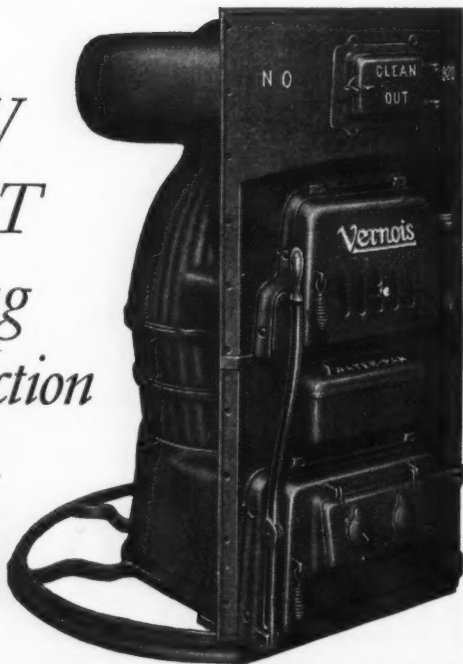
WHITNEY LEVER PUNCHES

<p>No. 4B PUNCH</p>  <p>Length—8½ inches. Capacity ¼-inch hole through 16 gauge. Deep Throat—2 inches. Weight—3 pounds. Punches and Dies—¾" to 1½" by 64ths.</p>	<p>No. 91 PUNCH</p>  <p>Capacity — ¼-inch hole through ¼-inch, 1-inch hole through ¾-inch and 2-inch hole through ¾-inch iron. Depth throat 5-inches. Weight — 82 lbs.</p> <p><i>We have tools for every purpose needed by Sheet Metal Contractors.</i></p> <p><i>Ask your Jobber</i></p>	<p>No. 1 PUNCH</p>  <p>Length — 34 inches. Capacity — ¼-inch hole through ¼-inch iron. Punches and dies in sizes from ¼" to 1½" by 64ths.</p>
<p>No. 6 PUNCH</p>  <p>Length — 26½ inches. Capacity — ¼-inch hole through ¾-inch iron; especially adapted for button punching or templet work. Punches and dies ¼" to 1½" by 32nds.</p>	<p>No. 2 PUNCH</p>  <p>Length — 23 inches. Capacity — ¾-inch hole through ¼-inch iron. Punches and dies in sizes ¾-inch to 1½-inch by 64ths.</p> <p>CHANNEL IRON PUNCH</p>  <p>Companion to No. 2 Punch. Every part of the two Punches interchangeable, including punches and dies. Capacity — ¼-inch hole through ¼-inch iron.</p>	



WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

Sell LOW COST Heating Satisfaction



» » HOME owners everywhere, no longer content with inferior or inadequate heating plants, are now seeking low cost heating satisfaction. By offering these people the Vernois Furnace you can provide them with the surest means to the low cost heating satisfaction they desire. Every effort has been exerted by Vernois engineers to produce a perfect heating unit . . . a unit which would assure low cost

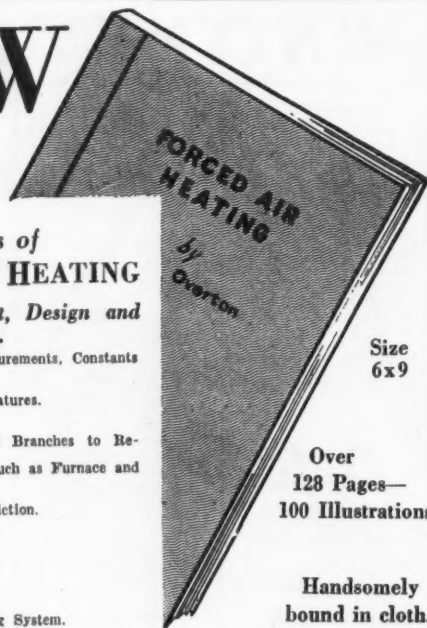
heating satisfaction. The result of their efforts is a furnace from which they will obtain maximum efficiency, exceptional fuel economy and years of trouble-free service. You'll be interested in the Vernois story . . . how Vernois will help your business . . . and how readily available Vernois profits are to you. We urge you to write for the complete Vernois story today.

MT. VERNON FURNACE & MFG. COMPANY
Manufacturers also of enameled circulating heaters for coal, gas, wood and oil; coal, wood and oil ranges; enameled gas ranges.
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NEW

Contents of FORCED AIR HEATING —How to Lay Out, Design and Install.

1. Heat Loss, Room Measurements, Constants and Factors.
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3. Selecting Inlet Temperatures.
4. General Design.
5. Pressures.
6. Designing Trunks and Branches to Resistance.
7. Sizing of Apparatus, such as Furnace and Fan.
8. Ideal System.
9. Where and What is Friction.
10. Velocities.
11. Branch Takeoffs.
12. Volume Dampers.
13. Bonnets and Plenums.
14. Inlets and Outlets.
15. Multiple Inlets.
16. Thermostatic Control.
17. Mechanics of a Heating System.
18. Chimneys and Draft.
19. Fan Physics.
20. Designing a System by the "Mechanical Code."
21. Sizing by Friction Chart.
22. "Tailor Made" Trunk Ducts.
23. Air Conditioning Radiator Heated Houses.
24. Specifications and Contracts.
- Appendix: Voohees' Tables of Coefficients and Factors.



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This new book by Platte Overton tells "how to do it." It is written so even a beginner can understand it. It leaves the theories about forced air work to text books, and gives its full attention to telling exactly how to lay out, design and install a forced air system for any house and under all conditions.

This great new volume is offered ARTISAN readers for only \$1.00. Send your dollar now, and your copy will be sent as soon as our supply is received from the printer,—some time before Christmas.

AMERICAN ARTISAN, 1900 Prairie Ave., Chicago

News Items

The Future of Air Conditioning

H. F. Wentworth of W. E. Wentworth & Son, Sherborn, Mass., sends us the following clipping from a recent issue of the Boston Herald with the comment the item certainly shows what the public is thinking and indicates why every sheet metal worker should feel encouraged about business prospects.

The item reads in part as follows:

Wanted—An Industry

Several times in the past the development of fresh industries has contributed mightily to the rescue of the country from its recurring depressions. Recoveries have been assisted vastly by the exploitation of new frontiers and by discoveries and inventions, giving rise to new industries. Many today are looking about, wondering when some new product or utility will appear with an almost universal appeal, and what it will be. The hint of one possibility is contained in the news reports of the great reductions which have taken place in the cost of air-conditioning passenger trains. A great line some time ago installed such a system in one of its crack trains; it cost \$14,000 a car. Another trunk line now contemplates air-conditioning all its passenger trains, local and limited, at an estimated cost of \$1,000 a car.

There is a big future for air-conditioning, without much doubt. It distinctly is "coming." Several companies large and small are in the field. The term is used in widely various ways, and comparisons of prices are not of value without exact agreements as to definition.

Real air-conditioning is understood by architects to mean thermostatic control, that keeps a room at a standard temperature, and with a standard degree of humidity, winter and summer, the occupant being able to increase or reduce one or both at will. New business and apartment houses and residences are often using such devices. The cost will lessen as production mounts and demand becomes general.

Half the present population has witnessed the progress by which the telephone has become the ordinary means of communication. More recently still the movies have achieved a startling conquest of popular favor. Air-conditioning may belong ultimately in the same category. Who can tell what the end may be?

Technical Products Company's New Trade Mark

A new trade mark is now appearing on all labels and products of Technical Products Company, of Pittsburgh, Pa., manufacturers of industrial cements and compounds.

The company now maintains a research department headed by Robert F. Ferguson, formerly of Mellon Institute of Industrial Research, to answer any inquiries or assist anyone with cementing troubles. Literature and catalogs are available upon request.

Patent Litigation

In December, 1932, Berger Bros. Company of Philadelphia, instituted suit for patent infringement against Long Island Tinsmith Supply Corporation and Whitney Metal Products Corporation, New York, based on infringement of United States Letters Patent No. 1,630,934, for improvement in support for gutter hanger circles, to George B. Geiser and assigned by him to Berger Bros. Company, because of the sale by Whitney Metal Products Corporation of supports for gutter hanger circles, covered by Nord patent, No. 1,920,520, owned by Whitney Metal Products Corporation.

By the decision of the Court rendered December 26, 1933, the Geiser patent was held valid and to be infringed by the Whitney Metal Products Corporation's support for gutter hangers.

Air Conditioning Discussed at Milwaukee Meeting

J. C. Miles, of the Miles Furnace Fan Division of the Henry Furnace & Foundry Co., Cleveland, Ohio, addressed the December monthly meeting of the Sheet Metal Contractors Association of Milwaukee on the subject "Latest Development in Air Conditioning and Household Blower Systems and a New Deal."

This address is one of a series which Mr. Miles is giving before local associations.

New Literature . . .

F. Meyer Discount Sheet

F. Meyer & Bro. Co., 1311 South Adams St., Peoria, Ill., will mail to dealers a copy of their January 1, 1934, dealer discount sheet covering the company's line of "handy" furnace pipe and fittings.

The discount sheet is to be used in connection with catalog No. 49.

Dealers should write to the company for copies of this sheet.

Enduro Booklet

A new booklet entitled "Enduro" has been prepared by Republic Steel Corp., Youngstown, Ohio, and contains a large fund of information on architectural applications of Enduro stainless steel.

Complete information on the properties, shapes, finishes and fabrication characteristics of the material are contained in the booklet. Leading architects and engineers collaborated in the preparation of the material presented.

Numerous actual applications of the material are discussed in detail with complete information covering each application cited. Photographs and drawings show recommended methods of fabrication and application.

A copy of the booklet may be obtained from the Republic Company.

United States Register Catalog

A new catalog No. 21 covering gravity registers and faces and a catalog No. 23 on forced air registers together with a January 1, 1934, discount sheet is announced by the United States Register Co., Battle Creek, Mich.

Tables for quantity purchases are indicated on the discount sheet.

Copies of the catalogs and discount sheet may be obtained from the company.

Stainless Steels in the Dairy Industry

The American Sheet and Tin Plate Co., and the National Tube Co., both of Pittsburgh, Pa., announce a new joint-booklet "U. S. S. Stainless Steels for Use in the Dairy Industry." This booklet explains by text and illustration the uses of this material for such items and utensils as pails, scoops, dippers, pasteurizing equipment, tube coolers, receiving tanks, soda fountains, milk trucks, etc.

Comprehensive information on the weights of material to be used for all of these products together with information on methods of handling during fabrication are contained in the text. In addition, tables of weights and dimensions, finishes and limitations are given. Copies will be mailed free.

New Ilg Catalog

The Ilg Electric Ventilating Co., 2850 North Crawford Ave., Chicago, Ill., announce the publication of their 1934 blower catalog No. 833.

This catalog contains full descriptions and illustrations of the features of the company's line of commercial fans and motors with complete listings of each unit's characteristics.

Full dimensions and characteristics of each unit are given in tables and numerous examples of the application of each type of unit are shown by illustrations. A copy of this booklet will be mailed free to any contractor writing the company.



Paint the sheet metal roofs in your territory with Thompson's "370 SPECIAL RED" — it will do a job which will be completely satisfactory to your customers and which will put real money into your pockets.

Thompson's "370 SPECIAL RED" is a heavy bodied Red Oxide Paint especially designed for Tanners and Roofers and offers positive protection to all metal surfaces, especially those exposed to the elements.

Pure Red Lead, Spanish Sesqui-Oxide of Iron and highest grade

Raw and Boiled Linseed Oil combine to make "370 SPECIAL RED" a paint which has extraordinary powers in resisting rust and corrosion.

"370 SPECIAL RED" is not just another paint, but a paint which gives you something to talk about to your customer—a fact which will go a long way toward getting the business for you.

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STAINLESS

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SHEETS

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In Sheet Metal Working Fields

and for Fine Installations and Craftsmanship

Insist upon U.S.S. STAINLESS Steel Sheets—produced in a number of grades and finishes, and adapted to a wide range of applications. Write for literature and full information on the following alloys—

U.S.S. CHROMIUM-NICKEL Steels, Austenitic: 18-8; 18-12; 25-12
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U.S.S. Chromium-Nickel Alloy Steels produced under licenses of Chemical Foundation, Inc., New York; and Fried. Krupp A. G. of Germany.

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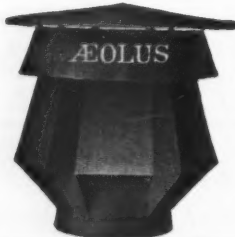
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Plates, etc. Write for further information.

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 FOR STOVES
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Improved
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FOR industrial buildings, schools, homes, theaters, etc. Made in 14 different metals. Constant ventilation—no noise—no upkeep.

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PRESS BRAKE

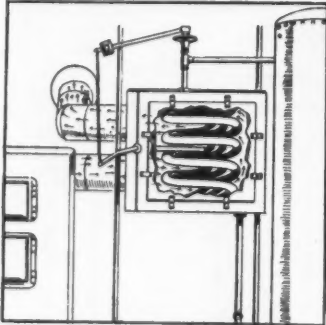


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Steel Brakes—Presses—Shears

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MARCUS
Smoke Stack
Water Heater



Supplies hot water from a warm air furnace. Utilizes the waste heat that goes up the chimney. Has an automatic control which assures an even temperature of the water.

PATENT PENDING

Agents Wanted

MARCUS WATER HEATER
 40 Paterson Plank Road, Union City, N. J.

New Literature . . .

Air Conditioning Catalog

Peerless Electric Co., Fan and Blower Division, Warren, Ohio, announce catalog No. 201 entitled "Air Conditioning."

This new catalog gives complete information on the sizes and characteristics of the company's duplex blower-filter units, blower-filter washer units, automatic controls, belt-driven blowers, motors, direct-drive units, forced-draft blowers, and junior furnace fans.

Full descriptions of each unit are contained in the text together with weights, prices, c.f.m., motor sizes and the characteristics of the blower and fan units are given in tables showing air delivery up to ½-inch static pressure. Suggested recommendations for the selection of proper size and correct application of the units are also covered.

A copy of this forced air booklet will be mailed to any contractor free of charge.

Domestic Coal Burner

Butler Manufacturing Co., Minneapolis, Minn., have prepared a new leaflet describing the company's "marvel" automatic coal burner sized for domestic installation.

The leaflet gives full information on the construction and operating characteristics of the unit together with prospect information describing the advantages of automatic coal burning.

Copies of the leaflet may be obtained from the company.

Air Conditioning Furnace Catalog

Bulletin No. 9 describing the air conditioning furnace of the Pennsylvania Furnace & Iron Co., Warren, Pa., is announced by the company. This booklet describes the advantages of air circulation, humidification, cleaning and gas heating in conjunction with photographs and descriptions of typical installations and full descriptions of the company's new air conditioning furnace.

Photographs and drawings show the features of construction for the furnace accompanied by descriptive text. Such special items as the evaporating pan, draft diverter, gas controls, fans and filters are shown in detail and described in the text.

Tables of characteristics of the various units are given. Copy of the booklet may be obtained free.

Champion Pipe Crimper

The Champion Tool Co., 356 West 91st St., Los Angeles, Calif., has ready for mailing a new sheet describing the improved Champion pipe crimper with an outline of the features of the tool and giving 1934 prices.

Full information may be obtained from the company.

Mercoid Price Sheet

The Mercoid Corp., 4201 Belmont Ave., Chicago, Ill., announce a new dealer's price sheet effective January 15, 1934. The data sheet covers all the various thermostats, limit controls, stoker controls, water controls, valves and other items manufactured by the Mercoid Company. List prices and discounts accompany each item.

Copies of the data sheet will be mailed to any contractor who writes the Mercoid Company.

New Literature

Parker-Kalon Data Book

Parker-Kalon Corp., 200 Varick St., New York City, announce a new catalog and data book giving complete information and technical data relating to the use of the company's various types of screws and nails.

The data book presents in interesting fashion suggestions on how to use the company's products in the fabrication and assembly of numerous common products in the sheet metal and sheet metal fabricating fields.

Tables give complete information on sizes of products and suggested weights and gauges of metals used in conjunction with the various sizes of screws and nails. Suggestions are also given on the proper method of using the products with various materials.

The booklet is elaborately illustrated with photographs and drawings showing the products and their applications and copies of the data book will be mailed to contractors who write the company.

Stainless Steel Booklet

The American Rolling Mill Co., Middletown, Ohio, announces a new booklet "What's a Good Stainless Steel Supposed to Do?" which will be mailed to any reader who writes the company.

Climate to Order

An elaborate booklet, in several colors and describing the advantages of air conditioning for home application has been prepared by the L. J. Mueller Furnace Co., Milwaukee, Wis.

The booklet presents by picture and text information suitable to the prospect on the advantages of air conditioning with full discussion of the various steps in air conditioning which may be obtained with Mueller equipment.

In order, the booklet takes up humidity, cleaning, heating and automatic operation with excellent photographs showing the advantages of each of these operations.

The last part of the book is devoted to a discussion of the Mueller Climator and explains the unit's operations for winter and summer air conditioning.

Copies of this booklet will be mailed to anyone writing the company.

Motor Leaflet

A 4-page leaflet describing an improved split-phase motor with full information on the design of the motor and complete description of the characteristics is announced by the Emerson Electric Mfg. Co., 2018 Washington Ave., St. Louis, Mo.

Copies of the leaflet will be mailed free of charge.

Cozy Comfort Folder

Universal Humidifier Co., 4058 Joy Road, Detroit, Mich., have prepared a small 6-page leaflet describing the company's improved scientific humidifier.

This humidifier, which is of the pan type suitable for application in the furnace bonnet, is illustrated in the leaflet and full information on the construction, materials used and capacities of the unit are given.

The company announces that sales of the unit are to be handled by Fred R. Bishop, well known in the heating field. Mr. Bishop's address is the same as that of the Universal Company. Copies of the leaflet will be mailed to any interested contractor.

RYERSON

IMMEDIATE SHIPMENT FROM STOCK

More than twenty kinds of prime quality sheets are carried in stock. There is a special sheet for every purpose. Also Bars, Angles, Rivets, Bolts, Tools and Metal-Working Machinery.

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The
AKRON Air Blast FURNACE

The
SOLID COMFORT FURNACE



● The MAY-FIEBEGER Company, Newark, Ohio ●

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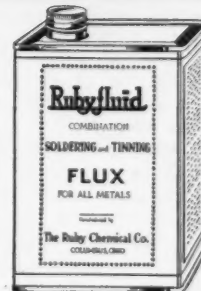
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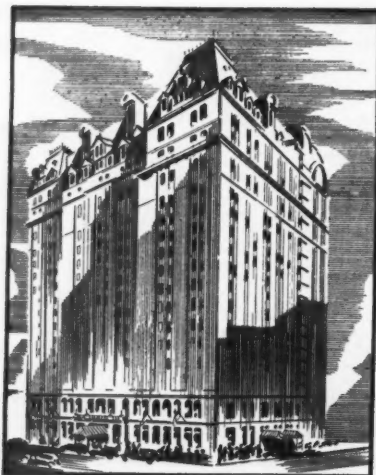
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All the distinctive characteristics of superlative living, the high standards of service, the inimitable food and the distinguished Michigan Avenue location are offered you today in a new dress at a daily rate from \$1.50 single without bath—from \$3 single with bath—double from \$5.

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**AUDITORIUM
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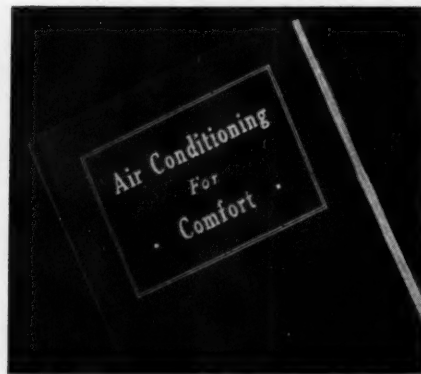
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- Chapter 6.—Calculations for Air Conditioning Requirements.
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- Chapter 8.—Air Distribution Within Rooms of Cooling Systems.
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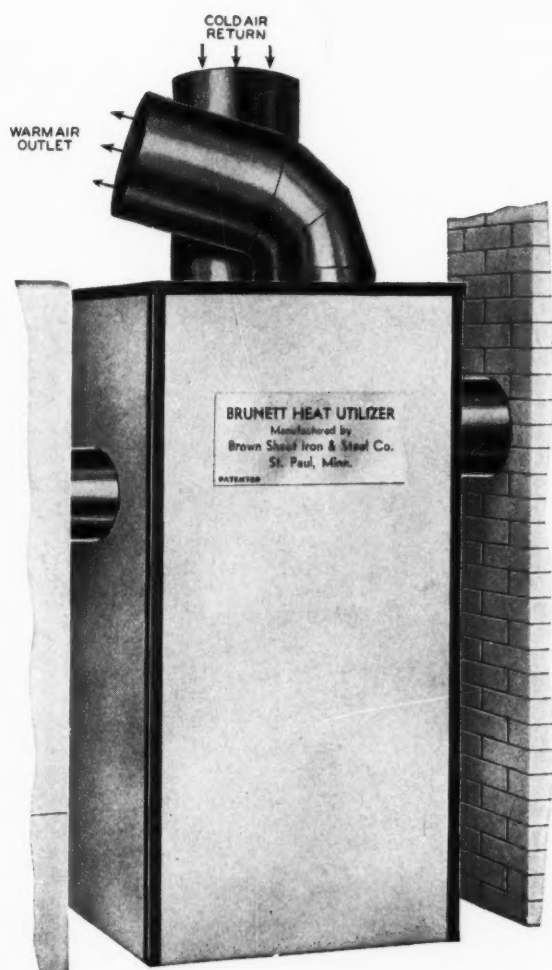
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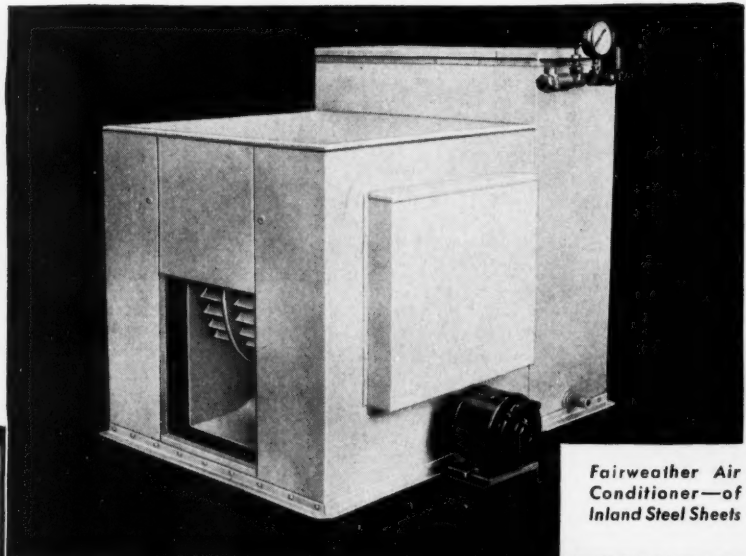
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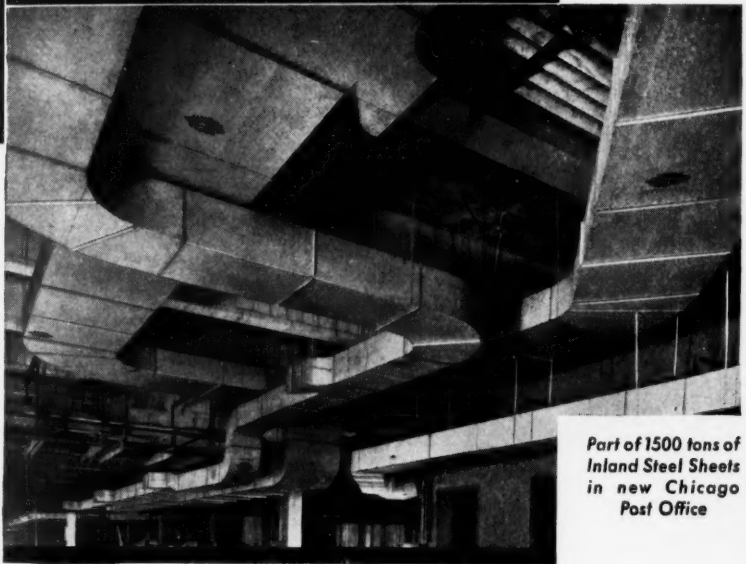
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